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WHO CHRONICLE

VOL. 13, No. 3 - MARCH 1959

The health of seafarers

Teaching of health statistics

Dangers of insecticide spraying

Executive Board : twenty-third session

Names for pharmaceutical preparations

WORLD HEALTH ORGANIZATION
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The World Health Organization (WHO) is one of the specialized agencies of the United Nations. Through this organization, which came into being in 1948, the public health and medical professions of more than 80 countries exchange their knowledge and experience, and collaborate in an effort to achieve the highest possible level of health throughout the world. WHO is not concerned with problems which individual countries or territories can solve with their own resources. It deals, rather, with problems which can only be satisfactorily solved through the co-operation of all, or certain groups of, countries—the eradication of diseases such as malaria, the control of cholera, plague, yellow fever, smallpox and rickettsiosis. Progress towards better health throughout the world also demands international co-operation in many other activities : for example, setting up standards for biological substances, for insecticides and insecticide spraying equipment ; compiling an international pharmacopoeia ; drawing up international sanitary regulations ; revising the international lists of diseases and causes of death ; assembling and disseminating epidemiological information ; recommending non-proprietary names for drugs ; and promoting the exchange of scientific knowledge. In many parts of the world, there is need for improvement in maternal and child health, nutrition, nursing, mental health, environmental sanitation, public health administration, professional education and training, and health education of the public. Thus a very large share of the Organization's resources is devoted to giving assistance and advice in these fields to countries and territories whose health services are in an early state of development and which are therefore weak points in the common front against disease.

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  The Chronicle is published in English, French, Spanish, Russian and Chinese.

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THE HEALTH OF SEAFARERS

Since ancient times the seafarer has been held responsible for carrying infection from one port to another. With the discovery of America and the expansion of navigation in the fifteenth and sixteenth centuries, new diseases made an appearance, such as scurvy, which for centuries remained a scourge of seafarers, and syphilis. Scurvy has long since lost its terrors, but syphilis among seafarers is still an important health problem and one on which much international action has been taken. It is being increasingly recognized, however, that venereal disease should be viewed against the wider background of the health of seafarers as a whole.

Between ancient times and the fifteenth century there was little change in the design of ships; both the warship and the merchantman were small vessels, unfitted by their construction for ocean navigation. Ships on the whole did not spend long periods at sea, and their crews depended less on food carried on board than on frequent calls at port. The seafarer was indeed a carrier of disease, which he picked up in one port and conveyed to the people on shore at the next; and because of his calling he was more exposed to infection than most land-dwellers. It gradually became recognized that this tendency of seafarers to spread infection called for preventive measures, and by the fourteenth century a system of quarantine had been introduced in Italy,[1] the first proper quarantine stations being set up by Venice at the beginning of the fifteenth century.

In the fourteenth and fifteenth centuries great strides were made in ship-building. Carracks and caravels were built, vessels greatly in advance of anything that had gone before and the first which were capable of ocean navigation. The compass had been invented in the twelfth century, the cross-staff and the astrolabe shortly after. The situation was therefore ripe for an expansion of exploration. The discovery of America merely gave impetus to a movement which already had much momentum of its own, increasing the number of small ships setting out on voyages lasting weeks or months over totally uncharted expanses of ocean, peopled with unimaginable devils and monsters.

Unimaginable maladies lay in wait for the unwary seafarer, too. " The said unknowen sicknesse began to spread itselfe amongst us after the strangest sort that ever was eyther heard of or seene, insomuch as some did lose all their strength, and could not stand on their feete, then did their legges swel, their sinnowes shrink as black as any cole. Others also had all their skins spotted with spots of blood of a purple colour: then did it ascend up to their ankles, knees, thighes, shoulders, armes and necke; their mouth became stincking, their gummes so rotten, that all the flesh did fall off, even to the rootes of the teeth, which did also almost all fall out. With such infection did this sickness spread itself in our three ships, that about the middle of February, of a hundred and tenne persons that we were, there were not ten whole, so that one could not help the other, a most horrible and pitifull case... There were already eight dead, and more than fifty sick, and as we thought, past all hope of recovery." [2]

The crews of these small vessels died like flies. No one paid sufficient attention to the problem of equipping a ship with enough food and water to last out till it could re-victual, so they often died from hunger and thirst. No one knew anything about the principles of dietetics, food taken aboard for consumption during the voyage being selected for its keeping qualities, not to provide the crew with a balanced diet. Deficiency states were accordingly common, creating such havoc as Hakluyt describes.

[1] Gear, H. S. & Deutschman, Z. (1956) *Disease control and international travel*, World Health Organization, Geneva

[2] Hakluyt, R. (1600) *The Principall Navigations*, London

Scurvy continued to be a major health hazard of long voyages for three centuries. In 1753 James Lind, a doctor in the British navy, published a *Treatise of the Scurvy*, in which he advocated the general use of lemon juice to ward off the disease, but it was not till 1795 that this treatment was sufficiently generally accepted for an Admiralty order to make lemon juice an obligatory part of naval rations. Once the simple remedy became known, scurvy and the fear it inspired soon became things of the past.

Conditions on board these tiny ships, which spent months at a time at sea, were primitive in the extreme. The crew's quarters were cramped, its members huddled together in virtually slum conditions. Food was bad and usually inadequate. There was no proper sanitation, little or no special accommodation for the sick, and no medical care or nursing until the vessel docked, if then. Not surprisingly, the mortality rate was high. Infectious diseases spread like wildfire, and if one of the crew had an accident and was badly hurt, his chances of survival were slight.

The Industrial Revolution brought with it an immense expansion of sea-borne trade. Bigger ships were built, and steamships began to oust the sailing vessels which from earliest times had carried men and merchandise across the seas. The new ships carried larger crews, but accommodation was as cramped as it had ever been in sailing ships, and disease was rife. The ships were faster, and so made port more frequently, with the result that one health problem—that of feeding the crew properly—was to a certain extent simplified. But little or nothing was done to make the crew comfortable in its quarters, or to provide the seafarer with something to do in his spare time either aboard or ashore.

Venereal disease and seafarers

Syphilis first became prominent in Europe at the end of the fifteenth century. From Europe it rapidly became known through the world, and the part played by seafarers in its spread probably was of great importance. While deficiency states and infectious disease have become of relatively minor importance in the hygiene of seafaring life, venereal diseases—syphilis, gonorrhoea, chancroid, lymphogranuloma venereum, donovanosis, and non-gonococcal urethritis —remain a major problem. Here is a group of diseases whose treatment was, until recently, long drawn out and unpleasant. Because of the stigma still, though perhaps decreasingly, attached to them, the seafarer or other patient may wish to hide the fact that he is suffering from a venereal disease and may be reluctant to attend the outpatient department of a general hospital or clinic. The disease may have such trivial symptoms in its early stages that he may be tempted not to do anything about it.

In 1802 Denmark enacted a law for the provision of free treatment of venereal infections in seafarers, whatever their nationality,[3] but this enlightened example was not widely followed, and it took a century for free treatment to become available in a fair proportion of the major ports of the world. The great increase in the incidence of venereal disease after the First World War, however, brought the problem to the fore.

The Brussels Agreement

In 1920 the Office International d'Hygiène Publique (OIHP) and the International Labour Organisation (ILO) advocated the free treatment of venereal disease in all large ports. The OIHP prepared a draft agreement on the subject, which it circulated in 1921 to its members. In the same year, the Belgian Government proposed to maritime nations, whether members of the OIHP or not, that they adhere to the OIHP draft agreement. The agreement was eventually signed at Brussels on 1 December 1924 and bore the title of the " Agreement of Brussels, 1924, respecting Facilities to be given to Merchant Seamen for the Treatment of Venereal Diseases ".

The Brussels Agreement, as it is generally called, was the first international health instrument which provided for free treatment of a disease on an international basis, without

[3] See *Int. Dig. Hlth Leg.*, 1956, 7, 160.

distinction of nationality. This was a considerable step forward in international co-operation in the field of health. The contracting parties undertook to establish services —with up-to-date technical equipment and a staff of modern specialists kept constantly abreast of the progress of medical science— for the treatment of venereal disease in their principal sea or river ports. The services were to be readily accessible, proportionate to the volume of traffic in the port, and equipped with a sufficient number of hospital beds. Treatment and medical supplies needed till the next port of call were to be free of charge. Each patient was to receive a personal card (on which, so as to spare him any possible embarrassment, he was to be designated by a number only) containing particulars of the diagnosis, the treatment carried out on shore, the treatment to be carried out on the voyage, and the results of serological examinations undertaken. The existence of the services was to be made known to crews by shipowners, masters of ships and sanitary officers.

The Brussels Agreement led to the establishment of centres for the free treatment of venereal diseases in many ports throughout the world. But it set various problems: administrative problems such as who or what agency was to cover the cost of the treatment—government, shipowner, health insurance or special fund; technical problems such as the international evaluation of the results of serological reactions. The OIHP and the League of Nations Health Organisation took up the technical problems and convened conferences on the serodiagnosis of syphilis in 1928 and 1930.[4, 5] In 1931, ILO, reviewing the Brussels Agreement,[6] reported that while some governments had not adhered to it, they were not opposed to it, and many had organized treatment for venereal disease in their own ports, usually free of charge. In 1933 the OIHP published a list of treatment facilities in ports throughout the world, and also revised the personal card, the revision being accepted by signatory governments in 1934. ILO, which was greatly interested in the seafarer's working conditions, and had established a comprehensive series of conventions for their improvement, in 1936 stressed the need for making known to seafarers the dangers of venereal and other infections, the means of preventing them, and the necessity of treatment; and also the need for the repression of soliciting in ports.[7] In 1936 the International Union against the Venereal Diseases (IUVD)—a non-governmental organization—took up the question of venereal diseases in inland ports. A system of treatment based on the Brussels Agreement was organized on the Rhine and on the Danube, and the OIHP included the major ports of these rivers in its world list of treatment facilities.

After the Second World War

The Second World War, like the First, was accompanied by an increase in venereal disease. But the situation at its close was fundamentally different from that at the end of the First, because of the advent of penicillin, though this was not at once universally recognized among venereologists to be a simple and effective form of therapy. The functions of the OIHP had been assumed by the Interim Commission of WHO in 1946, and the Organization therefore became concerned with the administration and revision of the Brussels Agreement. The WHO Expert Committee on Venereal Diseases, which scrutinized the Brussels Agreement in 1948 and 1949, held the view that more countries should adhere to it, pending the possible establishment, in the light of experience, of international health regulations for the control of venereal disease. Several nations, concurring with this view, notified their adherence to the Brussels Agreement, and 67 countries and territories are now parties to it.

[4] League of Nations Health Organisation (1928) *Report of the second laboratory conference on the serodiagnosis of syphilis held at Copenhagen, 21 May to 4 June 1928*, Geneva (C.H. 726)

[5] League of Nations Health Organisation (1931) *Report of the laboratory conference on the serodiagnosis of syphilis convened at Montevideo by the Institute for the Prevention of Syphilis of Uruguay (15-26 September 1930)*, Geneva (C.H.968)

[6] International Labour Office (1931) *Promotion of seamen's welfare in ports*, Geneva

[7] International Labour Office (1949) *International Labour Conference, Conventions and Recommendations, 1919-1949*, Geneva, p. 362

The same Expert Committee supported a proposal made by the International Union against the Venereal Diseases and the Treponematoses (IUVDT), as it was now called, for a port demonstration project in Europe to study the effect of improved methods of treatment on the problem of venereal disease in seafarers, and to disseminate the information acquired, which would be useful in assessing the value of the Brussels Agreement. Rotterdam was selected as a suitable port, for it was one of the largest sea ports in Europe, as well as the terminus for most of the Rhine shipping, and it already had a maritime health centre with a trained nucleus of medical, laboratory and medico-social staff. WHO and the Netherlands Government, the Municipality of Rotterdam, and the Central Organization for Skin and Venereal Disease Control at Rotterdam came to an agreement on the use of the existing centre, and the Rotterdam Port Demonstration Centre was formally opened in December 1951. It started work by organizing groups to study the Brussels Agreement, the establishment of treatment centres and hospitalization in ports, the treatment of venereal disease on board ships and ashore, laboratory procedures, evaluation and standardization, epidemiological procedures, the exchange of information about contacts, medico-social work, seamen's welfare, health education and legislation.

On proposals made by the riverain governments, WHO also established an International Rhine River Anti-Venereal Disease Commission, which met in 1951, 1952 and 1953, and co-ordinated the control measures taken by Belgium, France, Germany, the Netherlands and Switzerland. These measures were very successful indeed, and by the end of 1953 venereal infection among Rhine boatmen had declined to such a low level that the Commission could wind up its work on the grounds that the objective for which it had been created had been achieved and that the European Regional Office of WHO could keep a watch on the situation, and take any measures that might be required in the future.

WHO has followed in the footsteps of the OIHP and revised the international list of venereal disease centres in ports [8] and the seafarer's personal card, now called the individual treatment booklet (*carnet international*). WHO transmits information received regarding the inadequacy of port facilities to the government concerned. It provides certain services for the improvement of facilities in ports; for example, it has helped to establish a social hygiene clinic and laboratory to serve the ports of Chittagong and Karachi in Pakistan. And it publishes studies, sometimes in collaboration with the IUVDT, on the nature, extent and control of venereal infections in ports.[9,10,11,12]

At the time when the Brussels Agreement was signed, venereal disease was probably the most important health problem of seafarers, and the most important to shipowners from the point of view of loss of working time. Both the early and late, but particularly the late, stages of syphilis and gonorrhoea, as well as their treatment, usually meant time off work and sometimes resulted in permanent invalidism. Repeated doses of toxic arsenicals had to be given for syphilis, and long absences from work and several courses of treatment were required, so that it was exceedingly important for doctors to know what treatment had been given. The incidence of syphilis was high: in 1919, just after the First World War, in Denmark and Norway, two typical maritime nations, the over-all rates were 52.7 and 36.0 per 10 000, respectively, with a higher incidence in the larger ports.[13,14] The incidence of gonorrhoea was higher still. Conditions later became more stable and great efforts were made to control

[8] See page 151.

[9] Putkonen, T. (1951) Gonorrhoea among merchant seamen in Finland: material collected 1946-1949 and the official measures to prevent the danger. *Bull. Wld Hlth Org.*, **4**, 121-129

[10] Willcox, R. R. & Guthe, T. (1957) The management of venereal diseases in ports: an international survey. *Bull. Wld Hlth Org.*, **16**, 1033-1038

[11] World Health Organization, Regional Office for Europe (1956) *Maritime venereal disease control. A selection of lectures from the courses, in English and French, given at the Rotterdam Port Demonstration Centre, 1953-1954*, Geneva

[12] Hermans, E. H., Cavaillon, A. & Canaperia, G. (1957) *Le bien-être des marins dans les ports méditerranéens. Assistance sociale—prostitution, soins médicaux et lutte antivénérienne : rapport introductif.* In: International Union against the Venereal Diseases and the Treponematoses, *Conférence maritime sur le problème médical et social des marins dans les ports méditerranéens, Naples, 19-23 septembre 1955*, Paris, pp. 5-22

[13] Eliot, T. D. (1955) *Brit. J. vener. Dis.*, **31**, 2

[14] Gjessing, H. C. (1956) *Brit. J. vener. Dis.*, **32**, 86

syphilis, with the result that the rates in Denmark and Norway fell gradually to 2.2 and 1.5 per 10 000, respectively, for the period 1932-1935.

Although the gross tonnage of world shipping had by 1947 reached and passed the pre-war (1939) level of 69 440 000 tons, going on to exceed 100 000 000 by 1955, the incidence of syphilis was 1.1 per 10 000 for 1950-1952 in Denmark, and 0.8 per 100 000 in Norway for 1952-1955. This low incidence was obviously, at least in part, due to the introduction of penicillin. Statistics from ports, while they appeared to show a decline in early syphilis, did not lend themselves to definite conclusions regarding gonorrhoea, which appeared in some ports to be, if anything, on the increase.

In general, statistics should not be regarded as giving a wholly reliable picture of venereal disease in seafarers, for a variety of reasons. It is more than likely that the simplification of treatment has led to an increase in treatment outside hospitals and dispensaries by private doctors. The apparent decline in the incidence has had as a sequel an increased apathy towards measures designed to reduce the incidence further and towards careful notification of cases, an apathy well known in all fields concerned with the control of communicable disease. This apathy is often shared by the seafarers themselves: convinced that penicillin will cure them, they may postpone treatment indefinitely. Again, it has become a practice in recent years for persons not medically qualified to give penicillin on board ships. Some shipping companies prefer to make a private arrangement with port doctors to see members of crews of their ships; and some maritime nations have developed health insurance schemes covering illnesses abroad, so that seafarers can go to doctors privately. None of these consultations may be reported. The decline in venereal disease among seafarers may therefore be only apparent, and is indeed questioned by some authorities. That there are likely to be more sufferers from venereal disease than is currently reported is shown by an interesting experiment, conducted by a Dutch shipping company, which placed on board its freighters male nurses who also acted as ships' clerks. The percentage of cases reporting for treatment of venereal disease among the European seamen of 11 ships over a period of a year rose from 7.5 to as much as 17.

The extent to which the Brussels Agreement was being observed was the subject of an enquiry carried out jointly in 1952 by the Rotterdam Port Demonstration Centre and WHO. Questionnaires were sent to over 600 ports throughout the world, but only 185 replies were received. These replies were nevertheless of great interest. Many countries applied the Agreement in only a limited number of ports. Many provided no free hospital beds and only 30% of the ports provided hospital treatment at all. In quite a number treatment booklets were unknown. The international list of venereal disease treatment centres was to be found in only about a quarter. Pamphlets were distributed on board in 46 ports, and in a number of others pamphlets were available but were rarely distributed. Posters were used in only 60 ports. Differences in language were, naturally enough, a considerable problem in most ports. It may be inferred that facilities were no better, if as good, in the ports that did not reply to the questionnaire.

The Rotterdam centre also made enquiries into facilities for treatment and found that they were often unsatisfactory.[15] Sometimes the clinics were a long way from the docks and difficult to get to; or the hours of opening were short, or inconvenient; or the seafarer had to wait a long time. A few clinics were open for only an hour a day. In some countries there was reluctance to attend clinics in ports, because of racial prejudice, or lack of confidence in the treatment. The question of hospitalization tended to raise difficulties everywhere. Seafarers were unwilling to go to hospital because it was in a foreign country, or it cost money, or going to hospital meant that, on their discharge, their ship would be gone and they would find themselves unemployed and without money. Where there was a shortage

[15] *Chronicle*, 1954, 8, 21

of hospital beds, the health authorities naturally preferred to give first choice to their own nationals.

A variety of laboratory methods (23 in all) were in use for the diagnosis of syphilis; and diagnosis by darkfield microscopy was not possible in 20% of port clinics. In 65% more than 48 hours were required to obtain the results of serological tests: clearly too long a time if a seafarer was making only a short call in port.

In many ports the value of penicillin as a treatment for syphilis was insufficiently recognized, or little was known about long-acting preparations or suitable dosages. From that point of view the treatment given in ports was in sharp contrast to that given elsewhere, as was shown by a WHO survey undertaken in 1953. This survey reviewed the treatment provided by a representative selection of leading venereologists in 294 central (university and other) venereal disease clinics throughout the world.[16] More than 70% of these venereologists used penicillin alone in the treatment of early syphilis, in the form of long-acting preparations, in particular procaine penicillin G in oil with 2% aluminium monostearate (PAM), and many had adopted the practice of giving a massive initial "insurance" dose. Only 16% of port clinics, on the other hand, used penicillin exclusively for the treatment of early syphilis, and few used PAM preparations; the rapid intensive course with a massive initial dose was most uncommon. In 5% of port clinics arsenicals and bismuth were used exclusively, and in many they were combined with penicillin, the treatment being prolonged.

A survey undertaken by WHO two years later [17] showed a welcome increase in the use of penicillin by port clinics. Replies to a questionnaire were received from treatment centres in 171 ports (or large cities likely to deal with seafarers) in 25 maritime countries. Out of 167 systems of treatment, penicillin alone was used in 83.2% and penicillin plus metal in 16.8%.

[16] *Wld Hlth Org. techn. Rep. Ser.*, 1955, **92**, 14

[17] *Bull. Wld Hlth Org.*, 1957, **16**, 1033

Re-examination of the Brussels Agreement

The health of the seafarer, and particularly the problem of venereal disease as it affects him, must be viewed against the background of his psychology and way of life, and in the wider context of his welfare as an individual. This was recognized by a WHO Study Group on the Brussels Agreement.

This Study Group, which met at Oslo in December 1956,[18] concurred with the view that the Agreement had had a beneficial effect on the international control of venereal disease among seafarers, and had proved that medical assistance could be made available internationally without distinction of rank, nationality, race or religion. It was still more or less true, however, as had been observed by the IUVD in 1934,[19] that although there were many organizations working for seafarers, little was being done to assess to what extent seafarers were benefiting from this work, so that the Brussels Agreement was failing to a considerable extent through lack of attention to details of primary importance. No clear information was available on the extent of the services provided by governments, and statistics of national and foreign seafarers making use of them were rarely supplied.

The Interim Commission of the World Health Organization had favoured some revision of the Brussels Agreement, possibly in the form of international health regulations for the control of venereal disease.[20] It had suggested this just after the end of the Second World War, when the incidence of venereal disease was still high because of extensive movements of military and civil populations, unsettled conditions, unorganized health services, inadequate supplies of antibiotics, and lack of agreement between venereologists on norms of treatment. The Study Group believed that, even with the Agreement's recognized limitations, the situation was now so different that the establishment of international regulations conferred

[18] *Wld Hlth Org. techn. Rep. Ser.*, 1958, **150**

[19] International Union against the Venereal Diseases (1935) *Assemblée générale (Madrid 1934) : Texte des rapports et compte rendu des débats*, Paris, p. 141

[20] *Off. Rec. Wld Hlth Org.*, 1948, **9**, 39

no special advantages. The replacement of the Agreement by some other instrument would require complex machinery, and there was some doubt about the feasibility of international regulations for the control of venereal disease (or, for that matter, for the control of, say, tuberculosis).[21]

The problem of venereal disease nevertheless continued to exist among seafarers, although it was of diminished importance, and it was always possible that it might again become acute if inadequate attention was paid to control measures, or world conditions became less stable, or resistance to antibiotics developed. International agreement on the control of venereal disease in seafarers was therefore still needed, particularly since important reservoirs of venereal infection still remained in the less developed areas, and since maritime communications with these tended to increase *pari passu* with their economic and social development. The Study Group therefore considered that the Brussels Agreement should be retained, but that it was important for it to be kept abreast of technical developments—it was not sufficient to pay lip-service only to the provision to that effect in the Agreement—and for its implications to be constantly redefined in the light of the existing situation. It should therefore be reviewed periodically by a suitable WHO consultative committee of technical experts, which should also assess the degree to which its provisions were observed, and make recommendations regarding minimum standards of practice which could be transmitted to signatory governments and other interested Member States of WHO.

The WHO Study Group in Oslo was insistent, however, on the value of a broader approach to the problem of venereal disease in the seafarer: health administrations generally were concerned with a more comprehensive attitude to public health, in harmony with the modern concept of the integration of the preventive, curative, rehabilitative and other aspects of each health problem. Few other occupational groups illustrated the need for a broader approach so well, particularly as it had been shown that there was a markedly higher frequency of accidents, invalidism, and general, as well as special, disease in seafarers as compared with the general population.[22]

Before such a broader approach became feasible and internationally comprehensive health services for all seafarers could become a reality, many complex questions had to be faced. These included the nature and extent of the services to be provided, how best they could be provided—through maritime medical centres, for instance, or through arrangements with health insurance organizations and medical associations—how they could be financed, whether an international maritime health conference was desirable, and what type of international instrument would best serve the purpose. Indeed, considerable preliminary work was needed even before these questions could be considered. Information was required, for example, about the incidence of disease, invalidism and accidents among seafarers—which was available in only a few countries. Little definite information was available about health conditions among seafarers in ports, or about the needs for out-patient treatment, hospitalization, etc. in relation to the number of seafarers, their nationality, and the flags and tonnage of ships represented.

One way of approaching the problem would be step by step. Thus, it might be decided first to deal with individual diseases or groups of diseases, such as tuberculosis or tropical diseases, or even communicable diseases as a whole. An objection to this was that if any single disease or group of diseases was taken out of context, it would eventually become necessary to re-define the implications of any international agreement of a limited character as medical practice and social and economic conditions progressed. A committee set up by the Netherlands Government to examine the Brussels Agreement, aware of this objection, had stressed the importance of creating maritime medical centres, accessible to seafarers of all nationalities, where all, not merely venereal, diseases could be treated.

[21] *Wld Hlth Org. techn. Rep. Ser.*, 1958, **150**, 33

[22] *Wld Hlth Org. techn. Rep. Ser.*, 1958, **150**, 39

Various countries had devised schemes to look after the general health of their seamen. But in some countries the organization of these schemes was faulty, and in others non-existent ; a great deal could be done by international co-operation to remedy these defects. There was a need for a broad international instrument on the health of seafarers generally, to which interested nations could accede; and the Brussels Agreement could gradually be absorbed into the new instrument as maritime nations adhered to it.

The broader approach to the health of the seafarer

WHO and ILO had early recognized that the health of seafarers was a subject with which both were concerned, and that it was desirable that there should be no overlapping or duplication of work between the two organizations. They therefore set up a Joint ILO/WHO Committee on the Hygiene of Seafarers, whose first report appeared in 1950.[23]

Venereal disease was an important aspect of the seafarer's health, but it was far from being the only one. ILO's conventions on medical examinations, crew accommodation, and food and catering, and its recommendations on welfare in ports were obviously also of importance. The Committee's examination of the health of seafarers was therefore conducted on a broad front.

The Committee thought that a medical and X-ray examination should be made a condition of a seaman's employment, in order to prevent men with active pulmonary tuberculosis from being recruited into the merchant service. A scheme should also be evolved for subsequent periodical examinations, and both the initial and the subsequent examinations should not be confined to a search for tuberculosis only, but should cover the whole of the seafarer's health. The question of a medical record for each seafarer, analogous to the individual treatment booklet for venereal disease but covering the whole range of disease, raised important problems, such as that of secrecy, but deserved investigation.

The problem of providing the seafarer with a hospital bed when required was a complex one. It included the question of isolation on board ship for certain diseases; the need at times for the seafarer to be speedily transferred to receive skilled medical or surgical care; the provision of suitable food for seafarers in countries with a very different staple diet from their own; and the ancillary problem of medicine chests on board ship (minimum requirements and periodic overhauls). Nor was this all. There was the question whether seafarers always received as good hospital treatment as other sections of the population—and if not, whether this was due to national, racial or other prejudice, or because no one was responsible for ensuring that they went to the most suitable hospital. Complicating factors in the problem were the acute shortage of hospital accommodation in many countries and the lack of qualified medical men in some. More information was required on all these subjects.

The Joint Committee's second report appeared in 1955.[24] While statistics were as yet insufficient for the Committee to compare the incidence of tuberculosis in seafarers with that in the rest of the population or in other industries, it stressed certain important considerations which should be borne in mind in this connexion. Seafarers were often cut off for long periods from adequate specialist treatment, and, however good crew accommodation on modern ships had become, numbers of the crew were still herded together in comparatively confined spaces whether on or off duty. Furthermore, in the course of his duty the seafarer might well have to put ashore in countries where the incidence of tuberculosis was well above average. It was desirable, therefore, that all new entrants to the merchant navy be examined for tuberculosis. Periodic re-examination was also desirable, but views on compulsory examinations differed. The question of compulsion was not exclusively a medical one, and there were psychological objections to treating seafarers

[23] *Wld Hlth Org. techn. Rep. Ser.*, 1950, 20

[24] *Wld Hlth Org. techn. Rep. Ser.*, 1955, 92

as a special class when compulsion was not general or usual for other classes of employment. Careful attention should be given to rehabilitation of seafarers who had recovered from tuberculosis, so as to enable selected cases to go back to sea, and others to find suitable employment.

The Joint Committee's first report had reviewed the question of the medicine chests on board ship. Its second report contained a list of medicaments, instruments, appliances and other equipment for the guidance of governments in the preparation or revision of regulations in this connexion. It also directed the attention of governments to certain improvements that might be made in the provision of medical advice by radio to ships at sea.

The Joint Committee's second report also reviewed the maritime aspects of venereal disease control.[25] Modern treatment of syphilis had important direct and indirect consequences. Not only was the cost of treating a patient with penicillin 15-20% less than it would have been with bismuth and the arsenicals, but such treatment was ambulatory and completed within days instead of weeks or months. Practice varied, but in the merchant navies of some maritime countries patients with early syphilis were treated as out-patients with the result that absenteeism and working time lost in ports were reduced.

The Joint Committee considered that, as a contribution to the control of venereal disease, attempts should be made, despite the difficulties, to trace and to treat infected contacts. Up-to-date treatment should be employed universally, and vigorous steps taken by governments to see that it was. The WHO Expert Committee on Venereal Infections and Treponematoses had recommended in 1953 the preparation of a report on the epidemiology, therapy, and laboratory and other aspects of venereal disease control among seafarers. It would also deal—the Joint Committee hoped—with the employment of the seafarer during and after treatment, include a model scheme of diagnostic, therapeutic and other control practices in syphilis and other venereal infections, and assess the place of special examinations in routine periodical examinations.

[25] *Wld Hlth Org. techn. Rep. Ser.*, 1955, **92**, 12

Seafarers' health in the future

A great deal has been done since the beginning of the twentieth century for the seafarer's health and welfare. In the past he was largely ignored as a member of the community because of the impermanence of his stay in any one place; and he was to some extent treated as an outcast because of the danger of infection that he brought with him and the disturbances of the peace he was apt to cause. Now it is being increasingly recognized that he belongs to a vast industry which is entitled to enjoy reasonable working conditions as much as any other industry, and is indeed possibly entitled to greater consideration because of its special nature. His hours of work, his working conditions, and the accommodation provided for him in ships have been on the whole much improved, largely through the efforts of ILO. Naturally his working conditions vary throughout the world; they are, for example, by no means as satisfactory in the less developed countries as in the more advanced. By and large, however, there has been an impressive improvement.

Concurrently a greater interest has been taken in his welfare, and here again there has been a fuller recognition of the special nature of his calling, and of the social and psychological problems that are inextricably bound up with it. Much has been done to provide the seafarer with somewhere to go when he docks, suitable company, and something to do to while away his leisure; and recreation, books, and other amenities are being increasingly provided on board.

Welfare work for sailors is closely linked with the problem of keeping them in good health, for it is with justice claimed that a seafarer who has adequate recreation on board and an attractive centre to go to when he comes off ship is less likely to succumb to bouts of alcoholism and expose himself to infection in the more sordid quarters of the ports he visits. Medical examinations

are becoming more common, to ensure that the man taking up a seafaring life is in a fit state of health to do so, and that when he does so he continues to be in good health. The gravity of illness or accidents at sea has been reduced by the availability of medical advice by radio at almost any hour of the day or night, and by the possibility either of bringing a doctor to the patient by air or flying the patient from his ship to the nearest hospital on land.

With these advantages, with the improvement in his conditions of work and the better opportunities for recreation that are offered to him both on board and ashore, the future of the seafarer's health may be regarded with a certain optimism. There is still, however, much to be done. There is a wide gulf between the conditions of work and the health of seafarers in the more advanced and the less advanced countries. A certain amount of venereal disease is likely to occur among seafarers, however well it is treated. This may well become more important if circumstances change—if, for example, war again renders social conditions unstable. Resistance to antibiotics may develop; indeed, some countries report a rise in the incidence of gonorrhoea,[26] due in part to the appearance of penicillin-resistant strains of gonococci, in part to misplaced faith in " one shot " treatment, so that patients do not attend for observation after treatment or to be tested for cure. Certain fields, such as that of the seafarer's mental health, are still relatively unexplored. While the future may be regarded with some optimism, therefore, the optimism must be tempered with the realization that unremitting efforts are still required.[27]

[26] See, for example: Ministry of Health for England and Wales (1958) *Report of the Ministry of Health for the year 1957. Part II. On the state of the public health*, H.M. Stationery Office, London.

[27] Since this article was written, a conference to investigate measures taken in Europe for the health and welfare of seafarers has been held at Marseilles by the WHO Regional Office for Europe (see page 147).

TEACHING OF HEALTH STATISTICS

" In all countries, medical education has as its object the creation of conditions under which a student may acquire the knowledge, abilities, attitudes, and ethics that will enable him as a physician to promote, preserve and restore health.

" In addition to diagnosing and treating illnesses in the best way possible, the physician must concern himself with maintaining individuals in a state of health. He must understand the human being in his physical, familial, and social environment. He should, furthermore, be concerned with helping the progress of his own profession and with contributing toward enrichment of the medical sciences. To accomplish this, and since the education of the physician lasts throughout his lifetime, existence of a true scientific spirit is an absolute essential." [1]

[1] Translated from: Seminarios sobre la enseñanza de medicina preventiva. *Bol. Ofic. sanit. panamer.*, 1956, 41, 61-62

Seen against this ideal, the teaching of health statistics in medical schools is of special value, because it contributes to the development of the scientific attitude. Moreover, it informs the future physician about the collection and analysis of data, and makes him aware of his responsibility as the primary source of certain important information.

There is increasing recognition of the value of statistics to the medical profession, and of the great need for improvement in the teaching of statistical methods and their application to medical research. The South American Conference on the Teaching of Medical Statistics, which met at São Paulo, Brazil, from 22 to 28 July 1958, therefore came at an opportune moment. Held under the joint auspices of the Faculty of Hygiene and Public Health of the University of São Paulo and the Pan American Sanitary Bureau, which serves as the WHO Regional

Office for the Americas, the Conference was attended by professors of schools of medicine and public health from six South American countries. Its report has now been published.[2]

Present situation

At present, states the report, the teaching of medical statistics in South American medical schools is not satisfactory. In the majority of schools there is no regular instruction in statistics, and in others such instruction began in the past three years. Generally statistics is taught either in the basic medical science departments or in the department of preventive medicine, and only in a few schools is instruction given throughout the entire medical curriculum. The level of teaching is elementary, and both staff and equipment fall short of what they should be. In almost all schools, there is no professor exclusively responsible for the teaching.

A direct relationship was observed by the Conference between the degree to which the teaching of medical statistics had developed and each of the following: the use of effective teaching methods, the amount of collaboration by clinical departments in the teaching, and the organization and regularity of the teaching. In proportion as teaching developed, interest on the part of the various departments was found to increase.

Statistical activities in schools of medicine

It is desirable—and the report stresses the point—that in every medical school there should be a nucleus of people capable of providing adequate statistical instruction, and encouraging statistical activities. In addition to imparting instruction to medical students, physicians, teachers, those engaged in medical research and members of the paramedical professions, this nucleus should, for example, provide statistical assistance to the various departments of the school of medicine; carry out research in statistical methods applicable in medicine; and collaborate with other institutions in the study of problems of mutual interest.

[2] *Bol. Ofic. sanit. panamer.*, 1959, 46, 109

For an adequate discussion of the medical curriculum the normal functions of the physician require analysis. In general he is required to make decisions on the basis of observations which are influenced by multiple factors and subject to error; to keep himself informed on progress in his profession by the study of selected papers from an extensive literature, about which he must form his own judgement; and to carry out investigations into relationships between factors which interest him, particularly causative and determining factors. To enable him to fulfil these functions he should have received instruction designed to provide him with certain knowledges, attitudes and skills. Such instruction should cover, *inter alia* : scientific method and its relationship to statistical techniques; the concept of biological variability and its association with a multiplicity of factors which influence profoundly the analysis and interpretation of biological data; the existence and measurement of error in all quantitative observations; and the complete, accurate, and timely recording of health and medical data.

The Conference laid down the principle that the teaching of statistics should begin in the first two years of instruction and continue throughout the medical course, advantage being taken of every opportunity to demonstrate its application in each branch of medicine taught to the student. The application of statistics to public health should be taught in the final years.

The content of the statistical course will vary according to local conditions. As a minimum, it should include the collection, processing, presentation and elementary description of the data, as well as the presentation of problems of inference by means of objective examples.

A typical course might deal with the following subjects:

(1) steps in scientific and statistical method;

(2) techniques for the collection (experimental design, sampling, sources of error, etc.), processing (types and classification of data, i.e., qualitative and quantitative),

tabular and graphic presentation, summarizing and description of the data (proportions, averages, measures of variability, some concepts of regression and correlation);

(3) statistical inference (concept, importance and basis); sampling errors, estimation of parameters, and tests of significance of proportions and of both independent and dependent means.

This course could be completed in 12-15 sessions of three hours each, devoted principally to practical exercises in which the student would take an active part. The subjects of the course should be treated in an elementary manner, and should suffice for the types of problem the medical student encounters during his studies and will encounter later in his professional activities.

The study of health statistics in the final years of the medical curriculum should lay stress on the methods of obtaining data, the fundamental role of the physician, and the importance of reports based upon the data. A suitable course might cover definitions, collection and analysis of data regarding population, environment, mortality, natality, morbidity, resources, and services; statistical organizations which furnish the data; the participation of physicians in these organizations; appropriate statistical techniques such as rates and indices, the application of the life table to chronic diseases, etc. This course could be given in 6-8 sessions of three hours each, and should also be devoted mainly to practical exercises.

There are numerous opportunities for the teaching of medical statistics throughout the medical course, in collaboration with the various departments. For example, genetics offers the possibility of discussions involving the binomial and *chi* square; bacteriology and pharmacology, the planning and interpretation of experiments in relation to biological assay; and clinical medicine the statistical problem of the evaluation of diagnostic and therapeutic methods.

It is of vital importance to awaken the interest of the student from the very beginning. This may be done by a careful selection of practical examples and applications of statistical method, which should be directly associated with his medical studies. It is important also to show the direct value of the statistical method to the physician, the errors that may be avoided by its application, and the dangers of its misapplication. Pure statistics should not be taught except in the training of professional statisticians, and the use of complicated symbols and mathematics should be avoided. To inculcate desirable attitudes, fix knowledge and develop skills, the best methods of teaching are the active ones, hence the importance of practical work. Group work stimulates the student's activity and should be widely encouraged. In a faculty of medicine only a minimum of material is required in the teaching of statistics. Nevertheless, specialized texts should be made available in the local language, for those interested.

For all these statistical activities a school of medicine requires at least one teacher who is exclusively responsible for statistics. There should be sufficient auxiliary staff to satisfy the teaching and other needs of the statistical nucleus. This nucleus may be autonomous in character, or it may be incorporated in some department of the school of medicine, in accordance with whatever local arrangements exist. It should have enough space, equipment and administrative staff to perform its functions adequately, and it should begin with a staff versed both in statistical methodology and in the medical and biological sciences. As it grows larger, it could, in view of the diversity of functions it has to perform, add specialized staff, but it should not lose sight of its special nature as a group of persons engaged in the application of statistics to the medical and biological sciences.

Recommendations for improvement

Where there are no statistical activities in a medical school, it is at first necessary to awaken the faculty's interest in the subject. For this purpose visits, courses, and lectures by professors and consultants from national or foreign centres could be encouraged. At the same time, efforts should be made to find

interested persons, give them an opportunity for a basic apprenticeship in appropriate centres, and make facilities available for the introduction of teaching in statistics.

If these methods are successful, the formation of a statistical nucleus on a full-time basis should be encouraged, by the provision of material resources and other suitable measures. It is necessary to ensure that the staff of the nucleus reaches and maintains a suitable technical level.

Within each country an exchange of professors and meetings of teachers of statistics would be of value.

International organizations could contribute to this plan through a scholarship programme which would send selected medical school staff for training to centres in South America; through the provision of consultants experienced in the teaching of medical statistics who could contribute to and stimulate interest in statistical activities and the training of teaching personnel; and through the translation and distribution of suitable texts. Training centres in medical statistics in South America, which are at various levels and operate in many fields, should be utilized nationally and internationally to remedy the scarcity of teaching staff, which is the most pressing problem.

Responsibility of the physician for providing statistical data

The physician is responsible, not only for providing data, but also for fostering an adequate system of recording information and for maintaining and improving existing statistical services. Without health statistics programmes for the improvement of the health of communities could not be planned effectively, nor could their results be properly evaluated. The physician should therefore make a special effort to fill in birth certificates carefully and accurately, for if they are complete studies can be carried out on the circumstances of birth (deliveries with and without complications), and on the characteristics of the newborn (sex, weight, diseases, anomalies, etc.), and of the mothers (age, number of pregnancies, parity, foetal deaths, live births, etc.). The physician's role in producing accurate and complete records is equally important in the certification of deaths, in the reporting of cases of notifiable diseases, and in the clinical reports on patients under his care. Many of the defects in health statistics are essentially due to deficient instruction on the part that the physician should play in their production, as well as to misconceptions concerning their importance and uses. The teaching of statistics in the department of preventive medicine should therefore be carried out in close co-operation with the clinical departments, advantage being taken of clinical meetings and of discussions of cases in infirmaries, etc. For example, the description of medical certificates of births and of foetal deaths could be carried out most effectively in the departments of obstetrics and of paediatrics, and instruction on the reporting of notifiable diseases in the infectious diseases department. The distribution and use of available material on health statistics should be promoted in the departments of preventive as well as of clinical medicine. Physicians should be encouraged to make suggestions for the revision and improvement of existing statistical systems, which are admittedly imperfect, and for the simplification, and promotion of the wider use, of health statistics.

Vaccination certificate requirements

Under the International Sanitary Regulations, a health authority may require travellers to produce certificates of vaccination against cholera, smallpox and yellow fever. A recent supplement to the WHO *Weekly Epidemiological Record* (No. 6, 1959) lists vaccination certificate requirements as on 6 February 1959 for some 180 States and territories.

TOXICITY OF DIELDRIN TO MAN

Dieldrin is widely used as a residual insecticide in malaria eradication campaigns. In Indonesia, for example, it has replaced DDT because of the resistance to DDT developed by the chief local malaria vector, *Anopheles sundaicus*. Instructions are issued to spray squads to use it with certain precautions because of its toxicity, but the spraymen are not always as careful as they might be about exposure to the insecticide. A sprayman taking part in a campaign sponsored by WHO in South-East Asia is a typical example. He is a 21-year-old Indonesian who began working with dieldrin in April 1956, having had no previous contact with insecticides. While applying the compound, he wore shorts and a T-shirt, but no shoes and no hat. No soap was supplied to the unit in which he worked. Dieldrin, he knew, reached all parts of his body during spraying, but he claims that, before his evening meal each day, he took a bath at home, washing with soap. He had nine attacks of convulsions, each followed by a period of unconsciousness lasting about a minute, between August 1957 and January 1958. He continued to work with dieldrin during this entire period, and it was not until March 1958 that he was finally transferred to DDT spraying. He was treated for some of his attacks in a polyclinic, where he was diagnosed as having malaria. Neither he nor his family had any previous history of fits. He was normal on neurological examination.

This is not an isolated case. Others have been seen and examined by a WHO consultant, Dr Wayland J. Hayes, jr, who has visited various countries to investigate toxic hazards in dieldrin spraying programmes, and has reported cases from Venezuela, Ecuador, Nigeria, and India.

Dieldrin is freely absorbed by the skin, dry dieldrin being absorbed about as easily as dieldrin in solution. It is less than twice as poisonous by mouth as it is when absorbed by the skin, in this respect differing considerably from DDT. The oral toxicity of dieldrin is three to five times greater than that of DDT, but DDT in solution is not readily absorbed by the skin, and dry DDT is absorbed to such a small extent that its toxicity is not apparent.

The toxicity of dieldrin when absorbed through the skin has not, in the WHO consultant's view, been fully appreciated. All the unclothed skin of a sprayman (and, to a lesser extent, his clothed skin also) is subject to constant contamination during spraying operations. This " imperceptible " contamination is in addition to obvious contamination from spilt dieldrin or from direct contact with the powder or suspension. Chemical measurements of imperceptible contamination reveal its extent and show the relative unimportance of respiratory exposure.[1] These measurements are of special importance because it has commonly, and incorrectly, been assumed that the major source of dieldrin poisoning is respiratory exposure. Dieldrin is indeed poisonous if it is inhaled, but nearly all the dieldrin in water-dispersible powder is in particles that are too large for inhalation.

On the assumption that man is as susceptible to poisoning by dieldrin as experimental animals are, the mist of dieldrin which falls on the unprotected face and lower arms of spraymen is sufficient to account for the degree of poisoning which has been observed. This is not surprising; during the working day this mist, although imperceptible as it falls, often accumulates on the exposed skin sufficiently to form a visible residue.

A given dose of dieldrin is absorbed more readily by a large than by a small area of skin. Consequently, an increase in the area of skin exposed not only increases the dosage received but also facilitates absorption.

Many of the cases which have been recognized as poisoning by dieldrin have been serious; and little is definitely known of the early manifestations of such poisoning.

[1] Wolfe, H. R. et al. (1959) *Bull. Wld Hlth Org.*, **20**, 1

Several of the cases of dieldrin poisoning examined by the WHO consultant had one or more fits 15 to 120 days after the last exposure. Apart from convulsions, mental disorder has been found, ranging from loss of memory, insomnia, and nightmares to mania.

Very little is known of the pathology of dieldrin poisoning; or of the dynamics of dieldrin storage in the body. It is possible that it produces a persisting morphological or biochemical lesion, or both, which may give rise to recurrent illness; it is also possible that some of the effects are due to an allergic reaction. Nothing is known either about the influence of such factors as under-nutrition, infestation with worms, in-breeding or an "epileptic tendency", which have been put forward as possible causes of the clinical symptoms. These factors deserve consideration, but hitherto there is no evidence that they have any significance in determining the occurrence of poisoning.

There is clear evidence of a direct relationship between the dosage of dieldrin received and the occurrence of poisoning. The greater the concentration of dieldrin suspension used in spraying, for example, the greater is the chance of poisoning after a period of exposure. Moreover, the greater the area of bare skin exposed, the more likely is poisoning to occur. Again, the longer spraymen work under conditions which can lead to poisoning, the greater is the total incidence of poisoning. Immediate washing of the contaminated skin protects in part; delayed washing offers distinctly less protection.

One of the general principles of toxicology is that even the most poisonous compound may be used if adequate safeguards are provided. For that reason each worker hired for spraying operations should be told that he is working with a dangerous compound which has produced serious illness. The symptoms of dieldrin poisoning should be described in detail and the protective measures required outlined. There should be rigid supervision to ensure that hands, face, and all exposed skin are washed at frequent intervals, even though no contamination is visible, and that the entire body is washed with soap and water at the earliest practical moment after work has finished for the day. Free soap should be made available for this purpose. Working clothes should be washed daily with soap and water. The spraymen should wear shoes and socks, and a uniform that protects them as completely as possible and includes a veil of plastic netting.[2] These precautions have already been stressed by a WHO Study Group on the Toxic Hazards of Pesticides to Man,[3] and should be carefully observed.

In addition, sprayers must be kept in repair to prevent leakage; measuring cups, funnels, and other devices should have handles, so that workers can use them without touching dieldrin powder or suspension; and sprayers should be used at the lowest pressure consistent with effective control. There should be safety officers, and spraymen and mixers should not be permitted to work more than 8 hours a day or 40 a week. When a person has had dieldrin poisoning he should be taken off work with that particular insecticide, and he should be followed up medically for at least two years, and preferably longer.

A further study of dieldrin is needed, and cases of poisoning should be studied fully. It has been claimed that instant poisoning is detectable before serious manifestations occur, by means of clinical histories and neurological examinations at intervals.[4] This claim, and the question whether there is a method for measuring dieldrin in the blood or excreta, deserve further investigation.

[2] See illustrations on page 127.

[3] *Wld Hlth Org. techn. Rep. Ser.*, 1956, **114**

[4] Winthrop, G. J. & Felice, J. F. (1957) *Bol. Ofic. sanit. panamer.*, **43**, 512

DANGERS OF INSECTICIDE SPRAYING

The hazards of spraying with dieldrin are described in the preceding article. But exactly how much is a sprayman exposed to insecticide when he works? An experiment to determine this has been carried out with DDT in the Communicable Disease Center, Wenatchee, Wash., USA.[1] Absorbent pads were attached to various parts of a sprayman's body, and he was fitted with a respirator containing a filter-pad, before he carried out spraying operations comparable to those he would perform in the field.

The main area of exposure from indoor surface spraying is the upper trunk and upper extremities, and in this experiment these received about 1755 mg of DDT per hour of spraying. The average respiratory exposure was about 7.1 mg of DDT per hour of spraying, which is approximately equal to an inhalation of 3.4 mg of DDT per hour. The total potential exposure daily is 105 mg/kg for a worker who actually sprays for four hours of his eight-hour working day. It has been found in experiments that rats, which may or may not be more susceptible than human beings, can usually withstand the repeated daily exposure of 100 mg/kg of DDT to the skin but are killed as a rule by 200 mg/kg.

Various factors influence the amount of exposure. The lower the pressure of the spray pump the less the exposure. When an operator sprays surfaces above his head the exposure is greater; if the surfaces are

[1] Wolfe, H. R. et al. (1959) *Bull. Wld Hlth Org.*, **20**, 1

FIG. 1. DIELDRIN SPRAY-TEAM IN TAVETA-PARE AREA OF EAST AFRICA

Reproduced by courtesy of W. J. Hayes

FIG. 2. TROPICAL HELMET WITH PLASTIC-NETTING VEIL AND RUBBERIZED GLOVES, FRONT VIEW

Note coverage afforded by veil to neck, shoulder, upper back, and upper chest areas, as well as to face.

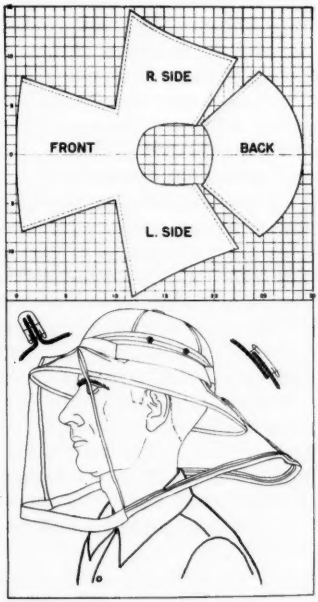
roughened, absorbent, or have already been sprayed, the exposure is less. It is increased with temperature, or when a water-dispersible powder is used rather than an emulsion.

The actual exposure of spraymen in working conditions in the field has been calculated in the Taveta-Pare area of East Africa by three members of the East African Institute of Malaria and Vector-borne Diseases at Amani, Tanganyika (*Bull. Wld Hlth Org.*, 1959, **20**, 15). Dieldrin is used here, not DDT. The men, it was found, are exposed to 1.8 mg of dieldrin per kg of body-weight daily for 180 days a year, with an interval of two months between spraying cycles. There have been no cases of poisoning.

Why is there no dieldrin poisoning in East Africa but poisoning in Ecuador (9% of the workers), Venezuela (18% of the workers) and Nigeria (10% of the workers)? The East African spraymen work on an average only six hours a day, and for only 180 days a year. Their overalls are washed daily, and 225 g of soap is issued to each man every week. In Venezuela, some men worked as much as 15 hours daily for seven days a week, with no break between spraying cycles. In Nigeria, hours and spraying cycles were much the same as in East Africa, but clothing was not washed as frequently and only 60 g of soap was issued every two weeks. Elsewhere, overalls are not worn at all and the amount of skin exposed is much greater. There is considerable variation in the degree of observation of precautions.

Various trials were made in East Africa before the protective clothing at present

FIG. 3. PATTERN AND DRAWING OF PLASTIC-NETTING VEIL, SHOWING TAPE-ATTACHMENT TO TROPICAL HELMET



The diagrams indicate details of the front and back seams and the bias tape used to reinforce them.

used (Fig. 1) was adopted as a routine. It consists of a cap of impermeable material with a curtain round the back of the head, which buttons at the neck in front, and a plastic visor from the forehead down; drill overalls to the wrists and ankles; and rubber gloves of medium thickness. Tennis shoes should be worn instead of the gumboots shown in the illustration, since the latter are hard to clean. This clothing resembles that found suitably protective in the American experiment (Figs. 2 and 3), except that in the latter a sun helmet and a plastic netting veil were regarded as more effective than a cap and visor, because the helmet is light and does not interfere with the circulation of air —a most desirable characteristic in a hot climate—and netting is easier to clean.

EXECUTIVE BOARD: TWENTY-THIRD SESSION

The Executive Board of WHO met for its twenty-third session from 20 January to 3 February 1959, in Geneva. Dr P. E. Moore, Director of Indian and Northern Health Services, Department of National Health and Welfare, Ottawa, was the Chairman of the session; the Vice-Chairmen were Dr A. Habernoll, Ministerial Counsellor, Federal Ministry of the Interior, Bonn, and Dr C. Díaz-Coller, Director of Experimental Studies in Public Health, Ministry of Health and Welfare, Mexico City. Dr J. Singh, Director-General of Health Services, New Delhi, and Dr M. Slim, Chef des Services techniques centraux au Secrétariat d'Etat à la Santé publique, Tunis, were Rapporteurs.

Declaring the session open, the Chairman paid tribute to the memory of Professor Andrija Štampar, Chairman of the Interim Commission of WHO and President of the First World Health Assembly, and welcomed those members who were attending an Executive Board session for the first time, namely, Dr J. Singh (designated by India), Professor E. A. Aujaleu (designated by France), Dr Cao Xuan Cam, alternate to Dr Le Van Khai (designated by Viet Nam), Professor M. Etemadian, alternate to Dr Radji (designated by Iran), and Mr. J. D. Lawrence, alternate to Dr Togba (designated by Liberia).

The Board had an unusually heavy agenda, including a large number of technical and administrative items. Some items of more general interest are reviewed below.

Programme and budget for 1960

The Director-General's proposed programme of activities and budget estimates for 1960 were examined by the Board and their adoption was recommended to the Twelfth World Health Assembly. The proposed effective working budget of $16 418 700 shows an increase of $1 251 960 or 8.25% over the revised budget for 1959. The proposed programme for 1960 reflects important new trends and changes of emphasis in the work of WHO, as a result not only of the experience gained by the Organization during its first decade, but also of the remarkable advances of medicine and allied sciences during the same period. One consequence of these developments is the widening of the concept of control to that of eradication in the case of such communicable diseases as malaria, smallpox and yaws, and eventually of tuberculosis and leprosy. In addition, a number of activities which in the past could be carried out only to a limited extent are to be expanded, e.g., vital and health statistics services, nutrition surveys, the control of bilharziasis, and research into cardiovascular diseases, cancer, onchocerciasis, arthropod-borne viruses, the epidemiology of mental disorders, and the teaching of psychiatry and mental health techniques.

Malaria eradication

The Board heard a report on the present situation with regard to malaria eradication

throughout the world. In southern Africa, the spraying of residual insecticides has given encouraging results, and a large-scale WHO-assisted eradication project is under consideration for the south-eastern part of the continent. In tropical Africa, despite successes in the Southern Cameroons, a number of technical problems have arisen, and a series of pilot projects is being undertaken to find out the best means of interrupting transmission of the disease. The cost of malaria eradication in Africa will be high and special steps will have to be taken to train enough personnel for the work.

The picture in the Americas is more encouraging. Eradication programmes covering practically the whole continent are planned. There is extensive international co-operation in eradication programmes, and training facilities have been brought to a high level of efficiency.

In the Eastern Mediterranean Region, eradication programmes are being carried out in Iran, Iraq, Israel, Jordan, Lebanon, and the United Arab Republic (Province of Syria). Other countries which have been engaged in control work for a number of years are fast approaching the pre-eradication stage. There is a regional malaria training centre in Cairo, and programmes are co-ordinated with those of neighbouring countries in the European and South-East Asia Regions.

Eighteen countries and seven other political units in the European Region are free from malaria. In several other countries, the disease has been virtually eliminated through country-wide programmes. In ten of the thirteen countries with indigenous malaria, programmes of total coverage are in operation. A WHO pre-eradication survey team has begun work in Morocco, and it is hoped to send a similar team to Algeria in the near future. There is close co-ordination with the Regional Office for the Eastern Mediterranean for programmes in North Africa.

Malaria existed until recently throughout the South-East Asia Region. It has already been eliminated from certain parts of Ceylon, India and Thailand. Almost all the governments in the Region have accepted the principle of malaria eradication, but legislation to facilitate spraying and surveillance operations has not been introduced, except in Ceylon. The training of staff is being carried out on the regional level at malaria institutes in India and Indonesia and a malaria training centre in Thailand; there is still, however, a shortage of technical personnel. WHO has provided technical advice and international staff to a number of countries and has taken steps to promote effective collaboration between the governments, UNICEF, and the US International Co-operation Administration (ICA).

In the Western Pacific Region anopheline mosquitos, and consequently malaria, are absent from one country and eighteen territories out of the fourteen countries and thirty-four territories making up the Region. No information on malaria is available in respect of the Chinese mainland, North Korea, the Mongolian People's Republic, North Viet Nam, and the Bonin, Cocos and Norfolk Islands. The estimated 44.7 million inhabitants of the remaining nine countries and thirteen territories are living in areas which are or used to be malarious; of these, only Singapore with a population of 1.4 million claims malaria eradication. Japan will probably achieve eradication in the near future and eradication campaigns in Cambodia, the Philippines, Sarawak and Taiwan are also far advanced. No definite eradication plans exist, however, elsewhere in the Region, and there is an acute shortage of professional and technical staff, except in the Philippines and Taiwan.

The Board called for an intensification of efforts towards malaria eradication, and the free exchange of relevant information between neighbouring countries to facilitate anti-malaria measures in frontier zones.

On 15 January, the Malaria Eradication Special Account fell short by approximately $1.3 million of the amount required to finance operations for 1959, and by approximately $8.4 million of the total amount required to finance operations in 1959 and 1960. Of the $8 227 000 contributed by that date, more than 90% had been contributed by one country, namely, the United States.[1]

[1] For later information on the Malaria Eradication Special Account, see page 148.

The Board therefore urged Member States to contribute to this fund, or to increase their contributions to it, and invited contributions from foundations, industry, labour organizations and private individuals.

Smallpox eradication

A report by the Director-General on the financial, administrative and technical implications of a world-wide programme of smallpox eradication, was also considered by the Board. While definite progress has been made in large areas of the world after intensive vaccination campaigns, the disease still remains a serious problem in Asia and Africa. Since the eradication of smallpox from an endemic area can be accomplished by the successful vaccination or revaccination of 80 % of the population within four to five years, the Board recommended that eradication programmes be organized in all countries still needing them, along the lines suggested in the report.

Plan for an intensified research programme

The Eleventh World Health Assembly had asked the Director-General to organize and arrange for a special study of the role of WHO in research, and of ways in which the Organization might assist more adequately in stimulating and co-ordinating research and developing research personnel. The Director-General's report on this subject was presented to the Board. It states that the expansion of international medical research is not only in accordance with the constitutional mandate of WHO, but a logical development of its first ten years of work. Such a programme should be primarily concerned with major problems which local effort is inadequate to deal with, either because of their magnitude or because the research potential of the area is low, as well as those better resolved by world-wide co-operative endeavour than by local groups.

It has always been WHO's policy to operate through existing national organizations, and this principle applies with particular force to research. The categories of problem suited to international collaboration include: those for which world experience is the unit of knowledge, e.g., demography, the genetic description of populations, the measurement of the incidence and prevalence of disease, and the characterization of the range of environmental factors, both natural and artificial; communicable diseases prevalent throughout the world (e.g., tuberculosis and many virus diseases) or over large areas (e.g., malaria); unexplained variations in the incidence and prevalence in different parts of the world of such diseases as cancer, coronary thrombosis, hypertension, rheumatoid arthritis, and diabetes mellitus.

A field to which WHO could make an important contribution is the standardization of material, e.g., antisera for the uniform identification of bacteria and virus strains, tissue culture media and standard cell strains grown in tissue culture in connexion with cancer and other research, etc. WHO could also do much to train research workers and facilitate exchanges of knowledge and experience between scientists, ultimately perhaps assuming the functions of a central international research organization. One important factor to be taken into consideration in an intensified research programme would be the establishment—in addition to the present advisory mechanism—of a scientific advisory body to the Director-General in order to keep medical research as a whole and research strategy under consideration.

The Board endorsed the principles outlined in the Director-General's report; a fuller study of the subject, together with financial estimates, will be submitted to the Twelfth World Health Assembly.

International Health and Medical Research Year

The Board discussed a resolution on an International Health and Medical Research Year adopted by the United Nations General Assembly and an associated proposal by the Government of the United States of America. It was the opinion of the Board that the observance by all countries of an International Health and Medical Research Year

" would result in an intensification of efforts in health and medical research work and would thereby further the objectives of the World Health Organization as established by its Constitution ". The Director-General was asked to submit a comprehensive report on all aspects of the subject to the Twelfth World Health Assembly.

Co-operation with UNICEF

The Board expressed its appreciation for the substantial support given to the malaria eradication programme by the United Nations Children's Fund (UNICEF) and expressed the hope that the latter would continue this support until world-wide malaria eradication was achieved. Satisfaction was also expressed with the continuing close and effective collaboration between the two organizations in international health work generally.

Regional Directors

Dr Abraham Horwitz (Chile) was appointed WHO Regional Director for the Americas, succeeding Dr Fred L. Soper, whose third four-year term of office ended on 31 January. The appointment of Dr F.J.C. Cambournac as Regional Director for Africa was extended.

Darling Foundation Prize

The Board noted with appreciation the decision of the Darling Foundation Committee to award the sixth Darling Foundation Medal and Prize to Dr E. J. Pampana, formerly Director of the Malaria Eradication Division at WHO Headquarters. The presentation of this award, which was established by the League of Nations to honour the work of eminent malariologists, will be made by the President of the Twelfth World Health Assembly at a plenary meeting of the Assembly.

Place and date of next session

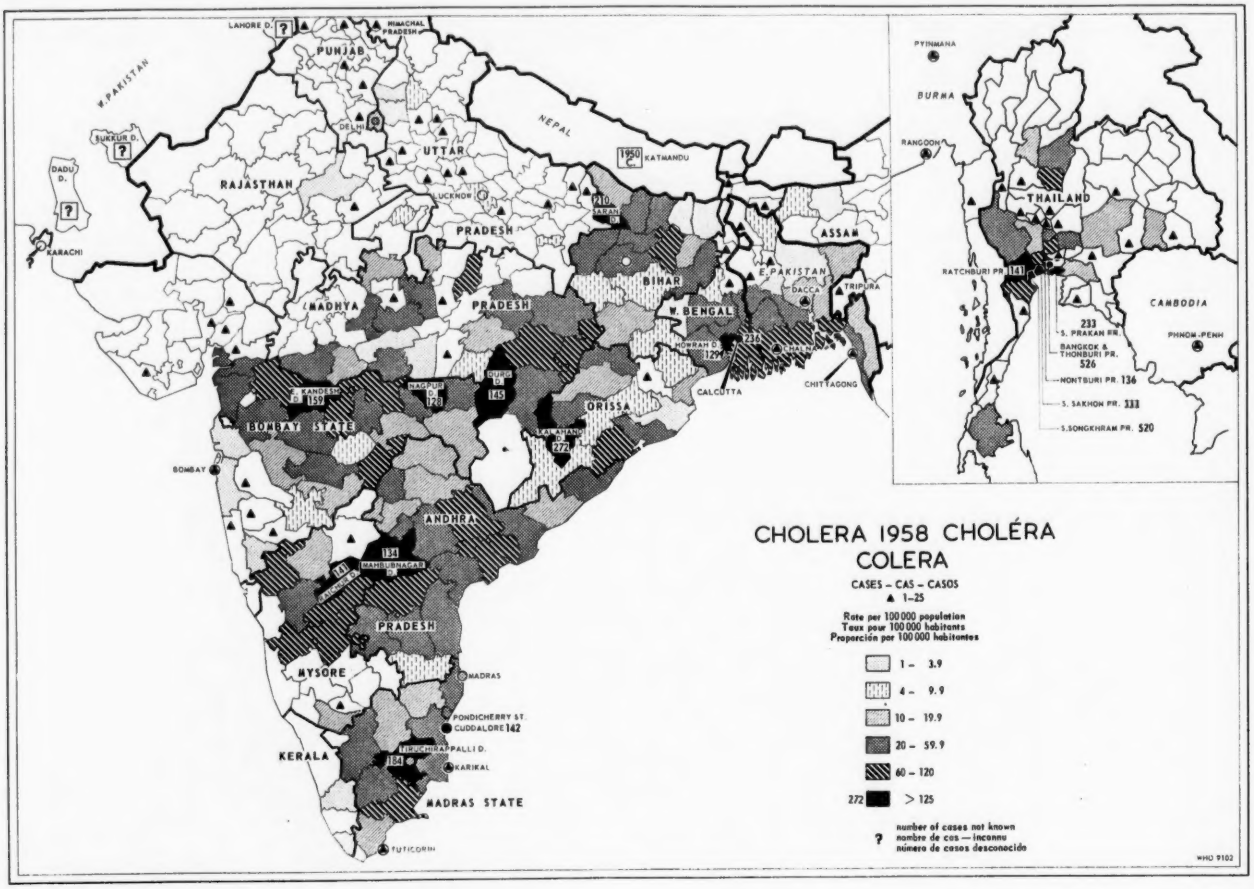
The twenty-fourth session of the Executive Board will be held in Geneva starting on 1 June 1959.

Epidemiological and Statistical Information

CHOLERA IN 1958

In a note on the world cholera situation, the WHO *Weekly Epidemiological Record* (No. 5, 1959) states that the incidence of the disease during 1958 was the highest recorded since 1953. About 93 000 cases were officially notified in Asia during the year as compared with 64 000 in 1957 and 242 000 in 1953. Epidemics occurred not only in India and Pakistan, but in Nepal and Thailand as well.

The maps on page 132 show the incidence of cholera in these countries during 1958. In the lower Ganges Valley, East Pakistan accounted for 20% of all cholera cases notified during the year. In the upper Ganges Valley (Uttar Pradesh and Bihar), 11% of all cases were recorded, while one half of all cases occurred in the central and southern parts of India, in the States of Orissa, Madhya Pradesh, Bombay, Mysore and Andhra Pradesh. In Thailand, which experienced its first cholera epidemic since 1949, there were 9396 cases, of which 6175 were recorded in Bangkok and its neighbourhood. The epidemic in Nepal occurred in the Kathmandu area, where 1950 cases were reported.


LAHORE D.
HIMACHAL PRADESH
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PRADESH
HOWRAH D. 129
CALCUTTA
CHITTAGONG
KANDESH D. 159
NAGPUR D. 198
BURAR D. 145
BOMBAY STATE
ORISSA
SAMBALPUR D. 272
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ANDHRA
134 MAHBUBNAGAR D.
KURNOOL D.
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CUDDALORE 142
TRICHIRAPALLI D.
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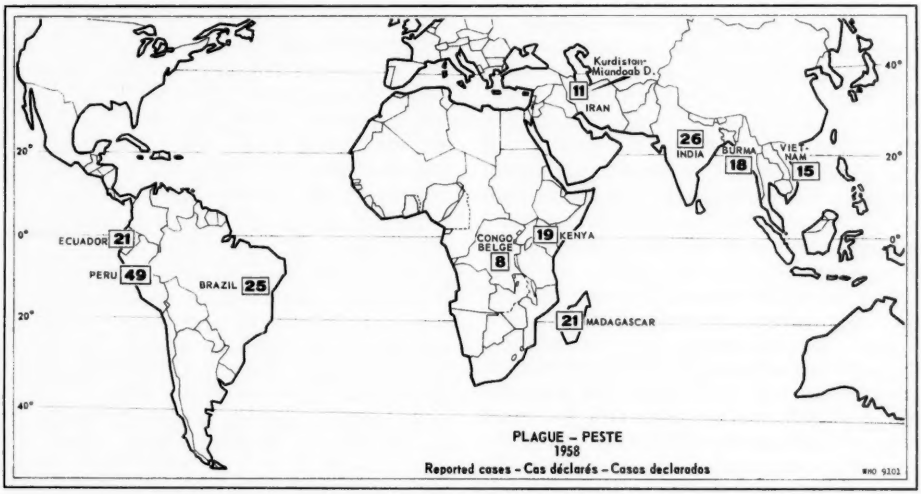
MADRAS STATE
TUTICORIN
PYINMANA
BURMA
RANGOON
THAILAND
RATCHBURI PR. 141
CAMBODIA
233 S. PRAKAN PR.
BANGKOK & THONBURI PR. 526
NONTBURI PR. 136
S. SAKHON PR. 333
S. SONGKHRAM PR. 520
PHNOM-PENH
CHOLERA 1958 CHOLÉRA COLERA
CASES – CAS – CASOS
▲ 1–25
Rate per 100 000 population
Taux pour 100 000 habitants
Proporción por 100 000 habitantes
1 – 3.9
4 – 9.9
10 – 19.9
20 – 59.9
60 – 120
272 > 125
? number of cases not known
nombre de cas — inconnu
número de casos desconocido
WHO 9102

PLAGUE IN 1958

The downward trend of plague incidence observed in recent years continued in 1958 when the number of officially recorded cases was the lowest since the beginning of the century. According to a recent issue of the WHO *Weekly Epidemiological Record* (No. 3, 1959), only 213 cases were officially recorded throughout the world in 1958, of which 26 were in India, as compared with 569 (47 in India) in 1957 and 15 399 (8230 in India) in 1951.



The accompanying map shows the distribution of plague cases throughout the world in 1958. In continental Africa 8 cases were reported in the Belgian Congo and 19 cases in the Central Province of Kenya. In Madagascar 21 sporadic cases were recorded. Active foci in America were to be found in Brazil (State of Bahia), Ecuador and Peru. A new focus of 11 cases was discovered in the Kurdistan-Miandoab area of Iran, and the disease was again reported from Viet Nam. In Burma, the number of reported cases fell from 198 in 1957 to 18 in 1958.

SIMPLE TABLES IN PUBLIC HEALTH PLANNING

Data which may be necessary or useful for planning public health activities are sometimes presented in complicated tables meaning hardly anything to the statistically untrained eye. As a result valuable information may be rendered inaccessible to many who could profitably use it in their daily work.

Often, however, simple statistical tables, such as those on infant and neonatal mortality published in WHO's *Epidemiological and Vital Statistics Report*, Vol. 11, No. 9, contain information which can be used both for the evaluation of past trends and for the planning of future health programmes on a national or international scale. This information is collected by WHO from the national health and statistical organizations; in some cases, there may be a certain amount of bias,

depending on the statistical methods used, but not enough to alter the basic value of the data.

It is well known that several countries have achieved very low infant mortality rates, e.g., Sweden (16.9 per 1000 live births in 1956, 17.1 in 1957), the Netherlands (19.0 in 1956, 17.2 in 1957), the United States of America (26.0 in 1956, 26.3 in 1957), etc., while the rates in certain other countries are approaching comparable levels. In many parts of the world, however, infant deaths still exceed 100 per 1000 live births annually, e.g., in Tunisia (167.3 in 1956, 126.8 in 1957), Chile (109.1 in 1956, 117.7 in 1957), etc. Moreover, there is evidence that infant mortality is even higher in vast areas of the world where there are neither medical services to reduce it nor statistical machinery to record it.

The neonatal mortality rates reported from the various countries show, however, a much smaller range of variation—thus, the lowest reported rate is that of the Netherlands, which had 11.9 deaths per 1000 live births in 1957, as compared to a maximum rate in Tunisia of 57.5 in 1956 (46.9 in 1957). This may, to some extent, be due to the presence of pathological factors common to the process of gestation everywhere, rather than environmental factors acting after birth.

It is also interesting to note that in countries where infant mortality has decreased considerably in recent years, there has been no comparable drop in the neonatal rates, so that countries with low infant mortality rates have a definitely higher proportion of neonatal deaths than those in which total infant mortality rates are still high.

This tends to confirm the assumption that the causes of neonatal death have been far less influenced by recent progress in maternal and child welfare than have those of late infant mortality, and points to the need for further research in this relatively unexplored field. In 1956, for example, the proportion of neonatal deaths to total infant mortality was 76.9% in Sweden, 71.2% in England and Wales, 72.3% in the United States, etc. In certain other countries, however, the picture is quite different: in 1956 neonatal deaths represented only 29.2% of total infant mortality in Algeria, 33.7% in Portugal, 33.2% in Chile, etc. These figures indicate where the public health authorities might profitably concentrate their efforts.

These data and the conclusions to be drawn from them are also helpful to WHO in planning and carrying out maternal and child health programmes in co-operation with national health authorities. Thus in Europe, where activities in this field have reached a fairly high level, the emphasis is on training and information activities, such as fellowships, national or regional seminars, etc. Elsewhere, however, much more extensive practical help is being given, often in co-operation with other international agencies, such as UNICEF,[1] in the form of mass campaigns against communicable diseases, the establishment or improvement of maternal and child welfare centres, nutrition and milk distribution programmes, and health education—in short, all the public health activities which may lead to a reduction in the number of infant deaths, and the better growth and development of children.

[1] See *Chronicle*, 1958, **12**, 361.

National participation in health programmes

The cost of an internationally assisted health programme cannot be reckoned in terms of the expenditure of international funds alone. An important element is the national contribution to the programme which, in many cases, would not have been made available but for the stimulus of international assistance. Thus, last year, WHO assisted national health programmes in 132 countries at a cost to the Organization of $12 739 524; the national contributions to these programmes amounted to $77 224 222.

Reports of Expert Groups

PUBLIC HEALTH TRAINING FOR FOREIGN STUDENTS

The development of public health services during the past ten years has been so rapid that it has not been possible for all countries to provide advanced training in public health to personnel required for key positions. The physician who wishes to make his career in public health, who already practises in that field and desires to improve his knowledge or to take advanced studies in order to devote himself to teaching, research or organizational work, is thus often obliged to go to another country to obtain the training he seeks.

In view of the problems raised by the varied backgrounds of students from different countries, the diversity of their aims in taking post-graduate courses abroad, and above all, the differences between the public health requirements in their home countries and those of the countries in which they take the courses, WHO submitted the matter for the consideration of an Expert Committee, whose report has just been published.[1] The conclusions of the Committee are, in many cases, applicable not only to foreign students, but to those of the countries in which the courses are given.

Helping the student to settle down

The report opens with certain general considerations, and goes on to examine, in its human and technical aspects, the problem of helping foreign students to settle down as members of the class.

The final responsibility for the selection of students rests with the school which is to provide the training. This means that it is essential for the school to receive from the sponsoring organization or government a clear and detailed account of a student's educational background; above all, the purpose for which he is taking the course and the aspects in which he is particularly interested must be specified in such a way that there can be no possibility of misunderstanding.

Everything possible should be done to make the student feel at home. It will be desirable to allow him a certain amount of time before the course begins to get his bearings, to make the acquaintance of his teachers, to become familiar with the organization of the school and, if possible, with the social and cultural life of the country. All this is especially important for students whose mother-tongue is not the same as that of the country where the course is given.

Guidance on teaching and personal problems may be given by faculty members assigned as advisers to foreign students (or chosen informally by the students themselves); joint advisory committees of students and faculty members can also be helpful in this respect.

The new student should be encouraged to present material on public health problems in his own country and to take part in social life (clubs, meetings, etc.).

Evaluation of the student's needs

Training in schools of public health must keep pace with the continuous developments in this field. Since no objective criteria for the evaluation of training requirements have as yet been established, it is necessary to rely upon subjective data and opinions from the members of the faculty, the students themselves and the sponsoring countries and agencies.

[1] WHO Expert Committee on Professional and Technical Education of Medical and Auxiliary Personnel (1959) *Sixth report : The foreign student and post-graduate public health courses (Wld Hlth Org. techn. Rep. Ser.*, No. 159), 23 pages. Price: 1/9, $0.30, or Sw. fr. 1.—.

In the first place, teachers must make themselves as familiar as possible with public health conditions in their students' countries of origin. For this purpose the system of awarding fellowships to teachers in schools of public health is an excellent one; in the case of senior faculty members, these fellowships can be combined with advisory services to the public health authorities of the countries visited. In addition, teachers should regularly evaluate their courses and the relative usefulness for their students—including those from abroad—of the subjects taught.

Secondly, official and non-official opinions may be obtained from the sponsoring agencies. In some schools, this is done through advisory committees composed of directors of the organizations or health administrations concerned. As an alternative, the international agencies might send experts to the schools. Meetings of directors of schools and heads of health departments might also be arranged.

Finally, the views of the students themselves might be obtained by means of questionnaires or interviews. This should be done when the student's opinion has had time to mature but before it is out of date: from two to five years after graduation would probably be the best time.

Curriculum

After recommending methods for evaluating the needs of foreign students, the report deals with the way in which courses should be planned and organized in order to meet those needs. It first of all specifies the subjects which should be taken by all students (biostatistics, epidemiology, public health administration and environmental sanitation), the rest of the programme being made up of optional subjects selected according to the students' particular needs. Instruction and work in small groups are especially valuable for foreign students; in the practical work, examples of a universal nature should always be used, with references to conditions in the students' home countries. The various members of the health team should be trained together in subjects of common interest. The programme should leave the student sufficient time for library work, research and private study.

As well as making the curriculum adaptable, so that it may meet the particular needs of each student, it might be advisable to add to the content of the courses. In the first place, the study of administration should include the principles of economics, banking and taxation, and methods of administrative research, planning and evaluation, as well as the various systems of financing and organizing medical care. It will also be necessary to provide for the training of students who wish to devote themselves to teaching or supervision, and to offer as complete a training as possible in the basic principles of environmental sanitation. Instruction in new aspects of public health (the utilization of atomic energy, with the health hazards and problems it implies; the problem of resistance both to drugs—as in the case of certain antibiotics—and to insecticides) should be available. While the usual post-graduate public health course lasts for one academic year, the expanding curriculum may make it necessary to extend it in some cases.

More attention should be paid to the practical aspects of public health studies. In so far as the foreign student is concerned, practical work will be more valuable when it is done in economic, social and cultural conditions equivalent or similar to those of the country in which he is to exercise his profession. Some experience of applying theoretical principles in unfamiliar situations may, however, be useful. In countries where, for any reason, it is considered impracticable to set up schools of public health, " teaching community health centres " might be attached to medical schools; students who have taken their public health training abroad could use these centres for their field practice.

One of the aims of post-graduate training should be to prepare students for research activities, by developing personal aptitudes for creative work and original thinking. The report stresses this aspect of training in relation to public health administration, since it will permit the student to evaluate administrative techniques which may have been

accepted and applied in a routine manner without any critical analysis.

Level of training of foreign students

As a rule the requirements for admission to a school of public health are based on the level of training of students in the country in which the school is situated. In the case of students with different basic training, certain exceptions are usually made with respect to admission requirements, and this practice should be continued. Once admitted, however, students should be expected to attain the normal level of performance required by the school for a degree, though this may not always be possible. A special certificate might be awarded to those who have done good work but have been unable to attain degree level.

General principles for post-graduate public health training

The report includes a recommendation for the establishment of minimum requirements or general guiding principles applicable to post-graduate training in public health throughout the world; the evaluation of existing schools of public health, and the creation of new ones, would undoubtedly be facilitated by this measure.

ADDICTION-PRODUCING DRUGS

The ninth report of the Expert Committee on Addiction-Producing Drugs [1] contains recommendations relating to the international control of the following narcotic drugs: nicomorphine, normorphine, oxymorphone, levomoramide, and dimenoxadol, all of which are considered to qualify for the same degree of control as morphine. In its fifth report, the Committee had recommended that it was desirable to avoid the manufacture, import and export of oxymorphone, but this recommendation is now withdrawn, since, in the light of subsequent clinical experience, it appears that the addiction-producing properties of oxymorphone cannot be considered more dangerous than those of other drugs comparable to morphine.

Two requests for the exemption from control of preparations containing the narcotic drugs normethadone and dioxaphetyl butyrate are considered. Although the Committee agreed that the use of these preparations in the recommended medicinal doses would not be likely to lead to the production of addiction, it is pointed out that they could be taken in much larger doses and more frequently than recommended. At present there is insufficient experience to set a limit of concentration for the exemption of preparations containing normethadone and dioxaphetyl butyrate, and the report therefore recommends that the requests for exemption should not be granted.

The Committee was concerned about the possible dangers of the prolonged use and potential misuse of certain non-opiate analgesic mixtures, containing phenacetin and other agents, such as aminophenazine, caffeine and a sedative, which are potentially habit-forming. Under certain conditions, the excessive use of such mixtures has presented characteristics approaching those of addiction, and the Committee felt that the situation needs to be watched closely.

Another cause for concern is the steadily growing consumption of codeine and dionine, which does not seem to be due entirely to population increases. It is conceivable that the use of these drugs in cough medicines is partly responsible, and attention is drawn to the possibility of replacing them by non-addicting antitussives, such as noscapine and dextromethorphan.

The report makes a plea for the use of international non-proprietary names for narcotic drugs and suggests that, where a chemi-

[1] WHO Expert Committee on Addiction-Producing Drugs (1959) *Ninth report* (*Wld Hlth Org. techn. Rep. Ser.* No. 160), 15 pages. Price: 1/9, $0.30, Sw. fr. 1.—. Also published in French and Spanish.

cal name is used, it should be identical with that which appears in the lists of international non-proprietary names published in the *WHO Chronicle* and by the United Nations Commission on Narcotic Drugs, or should be consistent with the principles applied to other drugs in these lists. In this connexion, reference is also made to the value of the "Multilingual list of narcotic drugs under international control" drawn up in 1958 by the United Nations. It is proposed to prepare regular supplements to keep this list up to date.

The report concludes with some comments on the third draft of the proposed single Convention on Narcotic Drugs. Among other points, attention is drawn to the seriousness of placing substances in Schedule IV because of a possible hampering effect on medical practice; the risk to public health, says the report, should be weighed against outstanding therapeutic advantage.

There are two annexes to the report, one describing a new technique for determining the development of physical dependence and tolerance when analgesics are used in the treatment of physical pain, the other outlining the progress that has been made in establishing a centralized source of classified information on narcotic drugs.

MALARIA ERADICATION

A malaria eradication programme calls for continuous evaluation, not only as a check on the effectiveness of the measures applied to prevent transmission but also to establish when transmission has ended, when spraying may be discontinued, and when the goal of eradication may be considered to have been achieved. The seventh report of the WHO Expert Committee on Malaria,[1] which is summarized below, is particularly concerned with the criteria for establishing each of these three end-points and with the techniques of survey and surveillance by which the necessary data are collected.

The criteria

Interruption of transmission of malaria is not easy to establish conclusively, particularly in the earlier stages of the attack phase of a campaign. The report emphasizes that the only true measure of the interruption of transmission is the absence of new infections in the population under consideration and that this can only be established by a full epidemiological enquiry and not by any simple form of random survey.

Before spraying can be discontinued, it is necessary to demonstrate not only that transmission has been interrupted but also that the reservoir of infection (number of persons with malaria parasites in the blood) has been depleted to the point where endemicity cannot be readily re-established. This necessitates a reasonably intensive search over large areas of country. It may be assumed, however, that any small residual foci which may exist will eventually be discovered and eliminated. Once this has been done and adequate surveillance over a period of three consecutive years has established that there is no evidence either of transmission or of residual endemicity, eradication may be considered to have been achieved. It is important, however, that during the last two years of surveillance neither chemotherapeutic cover nor specific general measures of anopheline control should have been applied.

Survey

In the planning stage of an eradication campaign, malariometric surveys are indispensable, their function being to establish the general epidemiological pattern or patterns. The findings may influence both the form and the length of the attack phase, and they also

[1] WHO Expert Committee on Malaria (1959) *Seventh report* (*Wld Hlth Org. techn. Rep. Ser.* No. 162), 50 pages. Price: 3/6, $0.60, Sw. fr. 2.—. Also published in French and Spanish.

supply a base-line with which the results of later surveys may be compared. During the planning phase and the early part of the attack phase, many of the traditional techniques of malariometric survey, such as the determination of spleen and parasite rates, may be used. The weight to be given to such surveys will vary according to local conditions and will tend to diminish as the campaign progresses, though they may furnish valuable data for deciding when spraying can be discontinued.

Once the attack phase starts, malaria becomes a dynamic condition and the techniques of evaluation must be modified accordingly. Malariometric survey gradually merges into surveillance, which the report defines as that part of the eradication project designed to discover any evidence of transmission, to establish its nature and causes, to eliminate residual foci, to prevent or cure any residual or imported malaria infections that would delay the ending of transmission or threaten its resumption, and, finally, to substantiate that eradication has been achieved.

Epidemiological surveillance

The report attaches particular importance to this method of evaluation and describes in detail the four main techniques: passive detection of cases, active detection of cases, entomological investigations, and epidemiological investigation of cases. Of these the most important are the active and passive detection of cases.

Passive detection means the notification of cases or suspected cases by members of the medical profession or non-medical voluntary workers. Although essential to some degree in all campaigns, the extent to which passive detection is feasible depends on the social, educational, and economic standards of the population, and on the availability and degree of co-operation of medical and other suitable personnel. Active detection is primarily a process of house-to-house visiting to take blood films, and is especially necessary in places where infections are often unassociated with clinical manifestations and so might escape passive detection. The two techniques cannot be quite dissociated, however, as active enquiry may be made in villages to supervise and assist those participating in passive search.

During the early part of the attack phase, active detection may be confined to indicator districts, but the report recommends that as soon as possible, and certainly throughout the consolidation phase, active detection should be extended to all areas, except those in which passive surveillance has been proved adequate. In many cases, active detection alone may provide sufficient information on which to base the criteria of eradication. Disadvantages of active detection are that it may be relatively costly and that it provides a discontinuous service. Consequently, there may be some loss of efficiency and possibly failure to gain local confidence. Monthly visits to villages probably represent the optimum frequency in most instances, but for special reasons it may be desirable to make the intervals longer or shorter.

Where the blood films are sent to a central or regional laboratory for diagnosis, it is important that the findings should be transmitted back to the field as quickly as practicable, a normal interval of not more than 72 hours being recommended. However, when a drug has been given with the object of preventing transmission, the report suggests that an interval of up to seven days may be allowed.

To ensure that surveillance is properly carried out, there must be adequate supervision at all levels. Malariologists should supervise the work of dispensaries, hospitals, and laboratories which are under the direction of medical graduates, and they should also discuss with medical practitioners all cases which they report and all death certificates giving malaria as the cause of death and demanding special enquiry. Dispensaries in the charge of nurses or other non-medical personnel should receive periodic visits from malaria inspectors, while passive surveillance undertaken by voluntary collaborators may be supervised either by malaria inspectors or by surveillance agents. House-to-house visiting by surveillance agents should be under the constant

supervision of malaria inspectors and other supervisory personnel.

Research in relation to surveillance

The report includes a number of suggestions for studies aimed at improving and elaborating the techniques of surveillance with a view to the more efficient conduct of eradication. For instance, it has been observed in some regions that *Plasmodium vivax* infections have disappeared much more quickly than had been expected following interruption of transmission. This indicates the need for studies on the duration of infectivity of the different species of malaria parasite in the human host. There is also a need for more precise knowledge regarding the number of clinical, parasitic and infective relapses to be expected in old cases after the start of the attack phase. The relationship between parasitaemia and clinical effects deserves special investigation, since it has a considerable bearing on the techniques of surveillance. There is evidence from field research that the number of days of asymptomatic parasitaemias differs greatly from the number of days with fever. Consequently, it is not sufficient for surveillance purposes to take blood from fever patients only; it should also be taken from subjects who have had fever in the interval since the previous visit.

Other subjects recommended as deserving study are: the proportion of fever cases, with no other obvious diagnosis, attributable to malaria under various circumstances; the relative densities of gametocytes in the blood of patients with symptomatic and asymptomatic infections; and the relationship between gametocyte density and infectivity to mosquitos.

The pre-discontinuation phase

Towards the end of the attack phase, the following epidemiological measures should be carried out:

(*a*) active search to discover malaria cases in each village or locality;

(*b*) determination of the origin of the cases discovered;

(*c*) recommendation of suitable measures to inactivate such cases as a source of infection.

The investigation should be based on a clinical history, blood examination and entomological investigation, and should extend to members of the patient's family, to non-relatives living in the same house with him, and to neighbouring houses. The report recommends that cases should be tabulated by the malaria eradication organization according to whether they are indigenous, sporadic, induced or introduced, and that positive and suspected cases should be tabulated separately. Positive cases should be reported through the authorized department of the health services so that they may be transmitted to WHO for international reporting.

These epidemiological investigations form a necessary prelude to the discontinuation of spraying, as only in this way is it possible to establish that the reservoir of infection has been reduced to the point where transmission cannot be readily re-established. It is important, however, that such measures should also be continued after spraying has been stopped in order that any residual foci or new infections may be quickly discovered and dealt with.

Resistance to insecticides

The wide occurrence of resistance to insecticides in various vector species of *Anopheles* was already the subject of discussion in the sixth report of the Expert Committee on Malaria,[2] and since that time many fresh instances have been discovered. An annex to the seventh report summarizes all the information received up to September 1958 on confirmed cases of resistance to chlorinated hydrocarbon insecticides. Resistance has proved to be strong enough to give the insect complete protection against the insecticide, and, furthermore, genetic studies have shown that resistance to DDT and its analogues is quite different from resistance to dieldrin, chlordane and BHC. There is no reason to

[2] *Wld Hlth Org. techn. Rep. Ser.*, 1957, **123**; see also *Chronicle*, 1957, **11**, 321; 1958, **12**, 60, 94, 207.

believe that both types of resistance might not develop simultaneously in one and the same area in one or more anopheline species, in which case no residual insecticide now in current antimalaria use could meet the situation.

The report makes the following recommendations for an expansion of laboratory studies on resistance:

(*a*) establishment and study of colonies of resistant and non-resistant strains of the same species in a few selected, suitably located and adequately staffed laboratories;

(*b*) further investigations on the range, inheritance and mechanism of resistance in anophelines;

(*c*) correlation of the effect of different insecticides and the properties of mixtures of insecticides.

If physiological resistance to an insecticide has been proved beyond doubt, the report recommends that a change be made to an insecticide of the other group of chlorinated hydrocarbons, which should be used in standard doses and cycles unless there is convincing evidence that lower dosage would be effective. If the alternative insecticide is not immediately available, or if there is proof of resistance to both groups of hydrocarbon insecticides, it is recommended that mass chemotherapy should be put into operation without delay. The development of new insecticides, such as the organophosphorus compounds, may afford other possibilities, however.

A problem allied to that of resistance is that of behaviouristic avoidance of insecticides. The report recommends that where the vectors show clear evidence of such behaviour and it can be definitely proved that interruption of transmission is being thereby prevented, spraying should be continued with the same insecticide, but experiments should be carried out to determine whether shorter spraying cycles, or a change to another insecticide, would help in reducing transmission. At the same time, mass chemotherapy should be instituted and full use made of antilarval measures wherever practicable.

Chemotherapy

Widespread experience has shown that, especially in the later stages of an eradication campaign, antimalarial drugs can be used not only to accelerate elimination of the parasite reservoir and interruption of transmission but also to deal effectively with residual foci and with imported and migratory cases. The use of chemotherapy in cases where spraying is ineffective has already been mentioned. The report stresses the need for discrimination in the use of antimalarials, however, in order to avoid wastage of energy and funds. It is recommended that during the attack phase every fever case should be given the standard single-dose treatment and, provided that the number of cases with parasitaemia is small, radical cure should be attempted. This procedure is even more necessary during the consolidation and maintenance phases.

The most effective and widely used drugs are chloroquine and amodiaquine. In semi-immune subjects, single-dose treatment with either of these drugs gives clinical relief in all forms of malaria and effects radical cure in most *falciparum* infections. The effect on transmission is slow or doubtful, however, so that additional treatment with an agent that will prevent transmission is desirable. It is recommended that a special effort should be made to develop a drug or combination of drugs which, in a single dose, will produce, without risk, radical cure of all forms of malaria and at the same time prevent transmission.

Reference is also made to recent studies on the value of medicated salt for administering antimalarial drugs. It is concluded that the use of this method is likely to be confined to those exceptional circumstances in which other methods are not readily applicable.

Other problems

The reduction in efficiency of insecticides due to sorption on mud walls has been under study for some time.[3] The report points out that, since most houses with mud walls have

[3] See *Wld Hlth Org. techn. Rep. Ser.*, 1957, **123**, 35, 36; *Chronicle*, 1957, **11**, 371.

roofs of non-sorptive material, the ideal insecticide would be one that combines the fumigant properties of BHC on sorptive surfaces with the prolonged contact action of DDT or dieldrin on non-sorptive ones. Laboratory studies on dieldrin formulations which might have a longer residual effect when applied to sorptive surfaces have yielded promising results and extensive field trials are now under way.

In many countries, malaria eradication operations are hampered by the presence of nomadic tribes or seasonal migrants. A similar problem is posed by dispersed groups, such as labourers, woodcutters, lumbermen, or fishermen living in summer huts or temporary shelters. Such groups may not be reached by the spraying teams and may continue to serve as scattered foci of infection. The report stresses the importance of regular spraying of the tents and temporary shelters with suitable insecticide formulations and suggests that tribesmen should be trained as auxiliaries to surveillance agents wherever possible. When the tribes are in their fixed sites, mass drug therapy should be instituted, perhaps with medicated salt.

The success of a malaria eradication campaign may also be jeopardized by failure to secure the full support and co-operation of the population. Intensive health education, combined, the report suggests, with methods used in public relations activities, is therefore essential. But a malaria eradication programme needs not only the support of the community but also the collaboration of many governmental and private agencies, professional groups and lay persons, and it must be protected against political changes and economic drawbacks. A very large number of groups have therefore to be approached and imbued with a sense of responsibility for the success of the campaign. The report lays particular stress on the role of the schoolteacher, since the whole school system provides a ready co-ordinated organization for the collection and dissemination of information.

As already stated in the sixth report of the Expert Committee on Malaria, efficient management of malaria eradication demands that the administration should be distinct from that of general public health administration. There is not considered to be any justification for modifying this view, although the possibility is allowed that the programme might be organized within the framework of the general public health administration in countries where this is decentralized.

The report concludes with a summary of the recommendations contained in the fifth report of the Committee on International Quarantine [4] regarding international protection against malaria. These recommendations are based on those made by a WHO Study Group convened in 1957 to examine international aspects of malaria control. The Expert Committee on Malaria endorsed the recommendations made and expressed the opinion that the action taken meets the present needs. It particularly emphasized that, as more and more countries approach the goal of malaria eradication, the need for inter-country co-ordination is becoming increasingly important.

[4] *Off. Rec. Wld Hlth Org.*, 1958, **87**, 413

A book on world health

A recent addition to the Pelican Medical Series, published in England by Penguin Books Ltd, is a volume entitled *World Health*, in which Professor Fraser Brockington, of Manchester University, discusses public health problems and their relationship to such complex factors as geography, beliefs and customs, family life, population, occupation, town living, hospitals, food and industrialization. Dr M. G. Candau, Director-General of WHO, has contributed a Foreword to this publication, which contains a special section on WHO and its work.

Notes and News

The influenza situation

Although, up to mid-February, the winter of 1958-1959 had witnessed no major influenza epidemic in Europe, there was a sharp rise in the incidence of the disease in several European countries during the first six weeks of the year.

In England and Wales, a number of localized outbreaks of respiratory infection were reported at the end of January, and by mid-February the number of notifications of pneumonia and deaths attributable to influenza had risen sharply. A-type virus, similar to the Asian strain, was found in at least six centres, and B-type virus in at least five centres. The results of serological tests suggest that most of the outbreaks, particularly in younger persons, were due to a B-type virus.

The incidence of influenza-like illnesses in Switzerland rose sharply in certain cantons during the second week of January. Similar outbreaks, localized at first but subsequently spreading throughout the country, have occurred in France; these outbreaks have been mild and the cause of infection is still being studied. A B-type virus was found in Paris, and in the west, centre and east of the country.

In the first weeks of February, there was a marked rise in the incidence of a mild influenza-like disease among Danish schoolchildren; serological examinations suggest that this outbreak was also due to a B-type virus. In the Netherlands, type B influenza has spread rapidly, particularly among children; pneumonia has been rare but a few deaths due to staphylococcal pneumonia have been notified.

Outbreaks were reported from several other parts of the Northern Hemisphere, but again there had been no major epidemic up to mid-February. In Canada, several outbreaks of acute respiratory infections were notified during January in Alberta, British Columbia, the North-West Territories, Newfoundland and Prince Edward Island. Local influenza epidemics have been noted in various parts of India; investigations in all cases, except one, have shown A2 (Asian) strains to be responsible. The incidence of influenza in the Eastern Mediterranean countries this winter has been at a normal level. In the United Arab Republic (Province of Egypt) 893 cases were reported between 1 September 1958 and 8 February 1959, as compared with 4823 during the corresponding period in 1957-1958.[1]

An improved immersion medium for microscopy

In a campaign for the eradication of malaria, it is particularly important to detect and treat cases of malaria when the stage of attack on mosquito vectors with residual insecticides is over; for an undetected, untreated case could jeopardize the whole campaign by infecting mosquitos and thus forming the starting point of an epidemic. In the surveillance phase of the campaign, it is therefore vital to examine the blood of fever cases for malaria parasites. The amount of work created by the examination of a large number of slides may, however, be so great as to constitute a bottleneck in the programme. Consequently any improvement in the technique of microscopy that will simplify the examination of slides deserves the closest attention.

One of the common immersion media used for the examination of blood slides is cedar oil, which has very nearly the same refractive index as the glass of the high power objective of the microscope. Cedar oil and the other

[1] While this number of the Chronicle was in preparation, reports were received by WHO of further increases in the incidence of influenza in several countries, including Bulgaria (where strains similar to virus A2 were isolated), Czechoslovakia, Denmark, the German Federal Republic, Sweden, and the United Kingdom. For details of these developments, see the WHO *Weekly Epidemiological Record*.

ordinary immersion oils are messy, and if the slide has to be re-examined they must be removed by xylene, which frequently leaves an iridescent film that interferes with the re-examination, and with repeated use discolours the Giemsa stain. In tropical areas, cedar oil thickens quite quickly, and often the xylene fails to dissolve it completely, leaving a granular, bi-refringent layer which prevents identification of the parasites. Finally, dry cedar oil is difficult to remove.

These are considerable disadvantages to the laboratory technician who is in a hurry, and various ways of overcoming them have been devised, by no means all of them satisfactory. But there have been in existence for a considerable time compounds which have none of these disadvantages, and yet, surprisingly, have not replaced the traditional media to any marked extent. These are methyl benzoate, also known as oil of Niobe, and methyl phenyl ether, commonly called anisol or anisole. They were first described in 1925 by Becher, a professor of zoology in Giessen, who drew attention to the many advantages they, and particularly anisol, possessed over cedar oil. Anisol is not greasy or sticky, does not harden, and volatilizes slowly from the slide. Its effect on Romanowsky stains is negligible, and its refractive index is close to that of cedar oil. Its drawbacks are minor: it is more fluid than cedar oil and so may flow if the slide is tilted; it may soften the mounts of some older types of microscopes (the makers should be consulted on this point); and because of its higher chromatic aberration it should not be used for high-definition photomicrography. But for ordinary laboratory microscopy, in the view of Dr Bruce-Chwatt, Chief, Planning Section, Division of Malaria Eradication, WHO (*Bull. Wld Hlth Org.*, 1959, **20**, 151), these are not important drawbacks compared with its obvious advantages.

Typhus in Afghanistan and Pakistan

Typhus is endemic in Afghanistan, particularly in the provinces of Kabul and Kandahar, and every winter used to bring an epidemic, since a large part of the population, whose living conditions were already far from satisfactory, crowded together in small dwellings to keep warm. In hot climates, the wearing of little or no clothing, exposure of the skin, bathing, and the lethal effect of high temperatures on lice, prevent the spread of the disease; but in Afghanistan and north-west Pakistan the winters are very cold, bathing is reduced to a minimum, the skin is kept covered as much as possible, and overcrowding in small houses facilitates the transfer of infected lice from person to person.

The danger of typhus epidemics is not limited to these areas, however. Every year, in or about October, tribes of Afghan nomads, the pawindas, travelling with tents, camels, horses and families, cross the Afghan border and penetrate for great distances into Pakistan, trading skins and rugs for foodstuffs and other wares which they take back into Afghanistan at the beginning of the hot weather. These tribes carry lice, and mingle with the local population at just the time when the winter cold compels the latter to move indoors, thereby often creating conditions very similar to those of the endemic areas of Kabul and Kandahar.

In 1949 there was an epidemic of typhus in Afghanistan, and WHO sent an expert consultant to investigate the situation. In the winter of 1950-1951, following news of successful delousing in South America by dusting the body and clothing with 10% DDT powder, the first antityphus campaign was begun by a WHO malaria control team in the cities of Kabul and Kandahar, with such success that the Government of Afghanistan received petitions asking for operations to be extended to other parts of the country.

In 1951 the Government of Afghanistan, UNICEF and WHO launched a large-scale joint campaign against typhus.[1] The campaign lasted through the winter, 312 832 persons being dusted with 10% DDT powder in the provinces of Kabul and Kandahar, and 70 000 in other provinces. During that winter not a single case of typhus occurred in the city of Kandahar, and only four in the city of Kabul, even though field operations

[1] See *Chronicle*, 1952, **6**, 351.

had started late because of a delay in the arrival of the DDT.

Antityphus campaigns continued to be carried out, not only in Afghanistan but also in Pakistan, which had had epidemics in two districts of the North-West Frontier Province in 1955-56 and in 1956-57. In 1958 a WHO entomologist-consultant visited the two countries to assess progress. The Pakistan programme is confined to the North-West Frontier Province, and includes dusting of Afghan nomads, Pakistani nomads, and the inhabitants of some villages. Operations begin in October and reach a peak between mid-November and mid-December. The pawindas are treated at eight points of entry into Pakistan, the Pakistani nomads at five points of exit from the mountains in which they live. In Afghanistan approximately 2 000 000 people have been dusted in each of the past two seasons. In Pakistan no resistance to DDT has been encountered, but lice in the Kabul area and Jalalabad jail in Afghanistan have developed a moderate degree of resistance to this compound.

After his survey, the WHO consultant made various recommendations: for additional dusting posts; for the re-siting of some existing posts; for resistance studies; for improvements in the technique of dusting; for changing from DDT to gamma-BHC in the Kabul area (with a later change to malathion, if WHO approves this drug); for the inclusion of certain other villages in the programme; and for a further entomological assessment in the autumn of 1960.

Daily epidemiological radio bulletin

On 27 January 1959, the daily epidemiological radio bulletin, transmitted by WHO from the Genève-Prangins station of Radio Suisse S.A., completed its first ten years.

The idea of a radio bulletin, which would provide health administrations with information to guide them in their quarantine activities, was not a new one, since a weekly epidemiological bulletin for health administrations in Asia had been started in 1925 by the predecessor of the present WHO Epidemiological Station at Singapore. The Geneva bulletin, however, extended this idea by providing daily information on a world-wide basis.

The bulletin contains official information received by WHO in Geneva on: (*a*) the occurrence of the quarantinable diseases, i.e., plague, cholera, yellow fever, smallpox, typhus and relapsing fever, in ports and airports; (*b*) declarations of areas as infected with quarantinable disease or free from such infection; (*c*) cases of quarantinable disease in localities other than ports and airports; and (*d*) outbreaks of non-quarantinable diseases, if of sufficient international interest.

An enquiry made in 1953 revealed that about forty health administrations throughout the world had permanent arrangements for the regular reception of the bulletin; others relied on it when information of special interest to them was anticipated.

The contents and length of the daily bulletin vary with the seasonal incidence of disease: in spring (Northern Hemisphere) reports on the spread of smallpox, mainly from endemic areas in Asia, may predominate, to be followed during the summer months by reports on the spread of cholera, while the bulletins broadcast in winter are likely to contain information on influenza trends.

During influenza epidemics, the bulletin has proved especially useful to health administrations by providing them with an authoritative, up-to-date survey of the situation. During the 1957 pandemic, for example, the information given in the bulletin often helped to counteract exaggerated or sensational press reports.

The entry into force of the International Sanitary Regulations in 1952 extended the scope and importance of the bulletin. Notifications under the Regulations have enabled WHO to specify with greater precision the areas where quarantinable diseases are present.

The bulletin is sent out in morse by eight transmitters: two omnidirectional transmissions (short-wave and long-wave) cover Europe, while six special beams permit short-wave coverage of Africa and the Mediterranean area, South-East Asia and Australasia, the North-West Pacific, South

America and West Africa, and Central and North America. On certain days of the week, the text of the bulletin is repeated in whole or in part from other stations for better reception in certain areas. Thus, it is retransmitted by Abu Zobal (Cairo) station on Fridays, by Saigon station on Saturdays and Wednesdays, and by Tokyo Usui station on Saturdays.

WHO Centre for Authentic Chemical Substances

During 1958, there has been a substantial demand from all parts of the world for each of the eight specimens now held for distribution at the WHO Centre for Authentic Chemical Substances, Apotekens Kontrollaboratorium, Stockholm. The original stock of one of the substances, d-tubocurarine, was nearly exhausted but is now being replaced. Another substance, beta-carotene, is also nearing exhaustion but there are no plans for renewing the stock since it is primarily used for testing foods rather than checking the quality of drugs.

The Centre is investigating the possibility of providing a series of authentic chemical substances intended to serve as standards for the determination of melting-points, as recommended by the WHO Expert Committee on the International Pharmacopoeia. In addition, the provision of a series of standards for calibrating spectrophotometers—also recommended by the Expert Committee—is under study.

Changing immemorial custom

In many villages in the less developed parts of the world women still go with pitchers to the well to fetch water, as they have done for thousands of years. The water is raised by a variety of devices, most of which are primitive in the extreme, involving a maximum of effort for a minimum of result, and leading to fouling of the surrounding area, with pollution of the water in the well. Rural sanitation schemes seek, as one of their aims, to make the water-supplies of the villages easy to get at and safe to use, while keeping the cost of any installations low.

For several years WHO has been assisting the Government of Ceylon with a rural sanitation project based at Kurunegala. The project team has now devised a simple type of chain lift pump, made of materials locally available, which could easily be enclosed to prevent contamination of the well. It consists of a continuous chain moving down into the well to below the water surface, up through a galvanized lift pipe, over a wooden pulley at the top, then down again into the well. The chain carries rubber washers of the same diameter as the lift pipe, which are fitted along the chain at intervals of about 38 cm (15 in.). When the pulley rotates, the closely fitting rubber washers moving upward inside the pipe lift the water, which is discharged through a special outlet at the top of the lift pipe.

The component parts are made of wood, galvanized iron, chain or wire, and rubber (from discarded tyre tubes), all readily available. The total cost of the first pump was US $20, but later pumps cost less, and one has been made for as little as US $6. This type of pump is thus very economical, and it is also popular, easy to use, and requires little maintenance. Further details are obtainable from the Division of Environmental Sanitation, WHO, Geneva.

Obstacles to international travel

The application of the International Sanitary Regulations as it affects international travel is examined each year by the Committee on International Quarantine. The last meeting of this Committee was held in Geneva from 20 to 24 October 1958.

Following the cholera and smallpox epidemics in Asia at the beginning of 1958, several countries took quarantine measures going beyond those authorized in the Regulations. Through the efforts of the Director-General of WHO, most of the difficulties arising from these measures were smoothed over, and the intervention of the Committee was confined to reminding all countries that the essential aim of the Regulations is to ensure the maximum security against the

international spread of disease with the minimum interference with world traffic.

A number of other questions were discussed by the Committee, including the disinsecting of aircraft, and international protection against malaria.

Mental health in Africa

An assessment of the mental health situation in Africa south of the Sahara was made at a meeting of experts held in Bukavu, Belgian Congo, in 1957 by the WHO Regional Office for Africa, the Commission for Technical Co-operation in Africa South of the Sahara, and the World Federation for Mental Health. The data collected at this meeting provided the background material for a mental health seminar which took place in November-December 1958 at Brazzaville, French Equatorial Africa, under the auspices of the same organizations.

The Brazzaville seminar was attended by some 30 psychiatrists, social scientists and public health administrators from various parts of the African Region. The discussions were mainly concerned with education and training in mental health work, and the organization of services. Specific topics included: the need for training specialized personnel even before hospitals are built; the role of psychologists and social scientists in training such personnel; the acceptance of mental health services by the community; therapeutic use of work and leisure time.

Food-borne diseases

Thanks to the development of water-supplies, sewerage systems, and sanitation in general, certain enteric diseases, such as typhoid and paratyphoid, are on the decline in Europe; large-scale outbreaks of food-borne disease are, however, becoming relatively more frequent. This situation is largely due to the growing use of processed and " ready-to-serve " foods, particularly in restaurants and canteens.

A Technical Conference on Food-Borne Infections and Intoxications was held in Geneva by the WHO Regional Office for Europe from 16 to 21 February 1959. The topics discussed included: the co-operation of public health administrations, hospital services and laboratories in detecting and combating food-borne diseases; methods of epidemiological investigation, control and prevention; the control of imported foods both in the producing and importing countries; administrative aspects of the problem such as licensing regulations, the laboratory examination of food, and the control of primary sources of food (farms, abattoirs, etc.).

The following countries were represented at the Conference: Denmark, France, Greece, Italy, the Netherlands, Norway, Poland, Switzerland, and the USSR. Representatives of FAO, the WHO Regional Office for Europe and WHO Headquarters also took part.

Health and welfare services for seafarers

A conference was convened at Marseilles by the WHO Regional Office for Europe in co-operation with the French Government, from 16 to 21 February 1959, to investigate present European practices in the field of seamen's health and welfare. It was attended by medical officers responsible for health services for seafarers, medical superintendents of shipping companies, and ships' surgeons and physicians. Twelve countries were represented: France, Federal Republic of Germany, Greece, Italy, the Netherlands, Poland, Portugal, Sweden, Turkey, the United Kingdom, the United States, and the USSR. Representatives of the UN Technical Assistance Administration, ILO, the Intergovernmental Maritime Consultative Organization and the United Seamen's Service were also present.

The topics discussed included: health services ashore; health services on board ship; mental health problems; dental health; social work for seafarers in France; and health centres for seafarers in Norway. The findings of the conference will be included in a world-wide survey of seafarers' health and welfare problems which has been undertaken by WHO.

Training course on virus diseases

During the past ten years considerable advances have been made in the laboratory techniques employed in virology, and spectacular results—notably the development of poliomyelitis vaccines—have been recorded.

A two-week inter-regional course on laboratory techniques for virus and rickettsial diseases was recently held at Coonoor, India, under WHO auspices. It was attended by laboratory technicians and virologists from Burma, Ceylon, Hong Kong, India, Indonesia, Iran, Iraq, Japan, the Philippines, Sudan, Taiwan (China), Thailand, the United Arab Republic (Province of Egypt), and Viet Nam. The latest laboratory techniques used in virology were demonstrated, and the public health importance of laboratory diagnosis of such diseases as poliomyelitis, encephalitis, exanthematous typhus, etc. was stressed.

The course was a particularly timely one since the incidence of poliomyelitis in several of the participating countries (e.g., Iraq, Jordan, Lebanon and the United Arab Republic) between July 1957 and June 1958 was substantially higher than in the previous twelve months. Another virus disease—encephalitis—has become a particular problem in India, where it has reached epidemic proportions during the past five years.

Inter-regional seminar on dental health

More than forty public health dentists from the Eastern Mediterranean, Western Pacific and South-East Asia Regions took part in a seminar held in Adelaide, Australia, from 10 to 20 February 1959, under the auspices of the WHO Regional Committee for the Western Pacific, the Australian Department of Health and the Australian Dental Association.

The purpose of the seminar was to review recent developments in dental health, and particularly in preventive dentistry, to seek solutions for current dental health problems in the participating countries, and to discuss standardization in the reporting of dental cases. Participants had the opportunity of attending the XVth Australian Dental Congress which was held the following week.

Contributions to Malaria Eradication Special Account

Three new contributions to the WHO Malaria Eradication Special Account have been announced since the beginning of 1959. The first was a sum of $3 million from the United States Government; this brings the total amount contributed to the fund by that country up to $8 million. This was followed by a contribution of 100 000 Swiss francs (about $23 250) from the Government of Switzerland, and one of approximately $31 500 from the Government of India.

The Malaria Eradication Special Account was set up in 1955 to receive voluntary contributions from governments and private sources, for malaria research purposes and to provide equipment, supplies and services for the eradication of the disease. Sixteen countries have now contributed to the fund to a total amount of approximately $8 258 000. It is estimated that WHO will need to raise a total of some $50 000 000 to meet its responsibilities in the world-wide malaria eradication campaign over the next five years.[1]

Soper Lectures in International Health

In honour of Dr Fred L. Soper, who served as Director of the Pan American Sanitary Bureau (WHO Regional Office for the Americas) for twelve years prior to his retirement on 1 February 1959, the staff of the Bureau has established a series of Fred L. Soper Lectures in International Health. The series—five lectures in all—will be given by outstanding medical personalities in successive years at leading schools of public health in the United States, Brazil, Chile, Mexico and Canada. The first lecture will be given this year by Dr Soper himself at the School of Hygiene, Johns Hopkins University, Baltimore, Md. The lectures will be financed by voluntary donations from PASB staff-members, and the lecturers will be chosen by the host universities and a committee of PASB staff.

[1] See *Chronicle*, 1959, **13**, 71.

People and Places

New Director of Health Services for South-East Asia

Dr Lucien Bernard, a French public health expert, has been appointed Director of Health Services in the WHO Regional Office for South-East Asia. He will advise the Regional Director on the technical aspects of all health activities in the Region and on the planning and execution of general and special health surveys. He will also, at the request of Member States, provide consultative services for government health programmes.

Dr Bernard studied medicine at the Medical Faculty of the University of Paris, subsequently specializing in microbiology at the Pasteur Institute, Paris. Prior to his new assignment, he was Assistant to the Director-General of Health, Ministry of Public Health and Population, Paris. He has attended most of the sessions of the World Health Assembly and the WHO Regional Committee for Europe as a member of the French Delegation, and has been a member of the WHO Executive Board.

Sanitary engineering in the Philippines

Since 1955 WHO has been helping the Government of the Philippines to strengthen the central environmental sanitation services of the Department of Health, and to develop the teaching of public health engineering and environmental sanitation at the Institute of Hygiene, University of the Philippines. Dr A. Q. Y. Tom, of Hawaii, took up his duties as sanitary engineer to this project in January. Educated at the University of Hawaii and the Massachusetts Institute of Technology, Dr Tom joined WHO in 1955 as sanitary engineer with the WHO-assisted environmental sanitation project in Taiwan (China). He had previously worked as a civil engineer in the Division of Sewers, Honolulu, directing and developing pollution surveys and research projects.

Leprosy control

A WHO-assisted leprosy control programme has been in operation in Thailand since October 1955. Control methods are demonstrated and local personnel are trained at a pilot project in Khon Kaen Province, from which activities are being extended to other parts of the country.

Dr M. C. L. Smith, who was recently appointed to the staff of the programme, will advise the Government of Thailand on the training of antileprosy workers, and help to develop a school of leprosy control. Dr Smith was educated at London University and the London School of Hygiene and Tropical Medicine. After working with the Ministry of Health for England and Wales and the British Red Cross Society, he served with the United Nations Korean Reconstruction Agency from 1952 to 1957, and subsequently with the Mission to Lepers in Korea and Hong Kong.

Malaria appointments in the Western Pacific Region

The malaria unit at the WHO Regional Office for the Western Pacific is being enlarged in order to meet commitments under the world-wide malaria eradication programme. One of the new staff-members of the unit is Professor C. Y. Chow, who has been appointed as entomologist. Professor Chow has studied biology, parasitology, malaria control, and medical entomology in China, India, and the United States. He has been with WHO since 1951, working as entomologist at the Malaria and Insect-Borne Disease Training Centre in Ceylon, and as entomologist-malariologist in Surabaya, Indonesia.

Another new staff-member of the malaria unit at the WHO Regional Office for the Western Pacific is Mr Pastor S. Echavez, who will serve as sanitary engineer. Mr Echavez obtained his diploma of civil engineering from the University of Kansas, and his diploma in public health from the University of Michigan. He has worked as sanitary engineer with WHO-assisted antimalaria projects in El Salvador and Taiwan (China).

Mr John W. Armstrong, of the United Kingdom, recently took up his duties as sanitarian in the WHO-assisted malaria eradication project in North Borneo. Educated at the London School of Food Technology and the Rutherford Technical College, Newcastle-on-Tyne, England, Mr Armstrong worked as a sanitarian with the United Nations Korean Reconstruction Agency from 1952 to 1955. He has taken a WHO malaria training course in London and Iraq, and comes to his present assignment from service on a WHO malaria advisory team.

Nursing education

A team of WHO nurse-educators in Singapore is helping the public health authorities with instruction in nursing administration, ward administration and clinical teaching, public health nursing, midwifery and psychiatric nursing. It is hoped that this programme will eventually lead to the establishment of a department of nursing studies at the University of Malaya.

Miss Norma Wylie, the latest member of the WHO team, studied nursing at the Universities of Toronto and British Columbia, Canada. She is a former Supervisor of In-Service Training at the Vancouver General Hospital.

Public health nurse for Viet Nam

For the past four years, a WHO team has been helping to develop maternal and child health services in Viet Nam. This team has now been joined by a public health nurse, Miss Sarah Sainte-Marie, of Canada. After graduating from Notre Dame School of Nursing, Montreal, Miss Sainte-Marie obtained her certificate in public health nursing at the University of Montreal. Before joining WHO, she served with the Victorian Order of Nurses for Canada in New Brunswick, Montreal, Winnipeg and Vancouver; she has also worked as head nurse in the paediatric unit of Notre Dame Hospital, Montreal.

Appointments in the Eastern Mediterranean Region

Dr Abdel Rahman Zahar, of the United Arab Republic, has been assigned to the Malaria Eradication Training Centre in Cairo, which serves the whole of the Eastern Mediterranean Region. A graduate of Cairo University, Dr Zahar subsequently studied entomology at Edinburgh University, and has served as Senior Entomologist and Head of the Fly Control Branch at the Ministry of Public Health, Cairo. Since 1952, he has been on the staff of the WHO-assisted malaria control project in Saudi Arabia.

A WHO-assisted project aiming at the eradication of malaria from Iraq within five years was started in 1957, as an extension of an earlier control programme. Dr S. S. Parameswaran, of India, has joined the staff of this project as malariologist. A graduate of Madras Medical College, Dr Parameswaran was house surgeon at Stanley Hospital, Madras, before taking up his appointment with WHO.

A WHO physiotherapist—Miss Gladys H. Johnson, of Great Britain—has just been assigned to the Karachi School of Physiotherapy, Pakistan. Miss Johnson, who comes to this assignment from a WHO project for the rehabilitation of handicapped children in Lebanon, was educated at St Mary's Hospital and the Morris School of Physiotherapy, London.

The second phase of a WHO-assisted BCG-vaccination campaign started in the Sudan in October 1956. Miss Cécile Hubert, of France, has been appointed as nurse with the team working on this project. Miss Hubert, who is the holder of a diploma of social medicine from the University of Caen, has already worked in WHO-assisted BCG-vaccination campaigns in Iraq, Libya and Pakistan.

Miss Sirkka Leva, of Finland, has been appointed nurse-educator with a WHO-assisted project in Teheran, Iran. After attending the University, the School of Nursing and the College of Nursing in Helsinki, Miss Leva took post-graduate nursing and teaching courses in London and the United States. She has held a number of responsible posts in paediatric nursing in Finland.

Changes at WHO Headquarters

The World Health Organization has recently lost the services of Dr Harry Sutherland Gear, Assistant Director-General in charge of Central Technical Services between 1951 and 1957, then Director-Consultant on the WHO Headquarters staff. He returns to the country of his birth, South Africa, to take up a position with the South African Council of Scientific and Industrial Research. Dr Gear was born in 1903 and educated at the University of the Witwatersrand, Johannesburg, and at the London School of Hygiene and Tropical Medicine. Before joining WHO in 1951, he had served as medical officer in Northern Rhodesia, Head of the Department of Preventive Medicine, Lester Institute of Medical Research, Shanghai, and Deputy Chief Health Officer in South Africa. In 1946, he represented the South African Government at the International Health Conference in New York, and was also the South African delegate at the first four World Health Assemblies. He was a member of the WHO Executive Board from 1948 to 1951, and was elected its Chairman in 1950.

As announced in the Chronicle for January, a Cardiovascular Diseases unit has been established in the Division of Organization of Public Health Services at WHO Headquarters. Dr Z. Fejfar, from the Institute for Cardiovascular Research, Prague, Czechoslovakia, has been appointed Chief Medical Officer to the new unit, which has the following tasks: to collect and disseminate scientific information on cardiovascular diseases; to stimulate and co-ordinate applied research on control measures for these diseases; to stimulate the adoption of standards and uniform nomenclature for their pathological and clinical diagnosis; to promote, co-ordinate and, where necessary, undertake epidemiological studies in this field; and to act as the secretariat for the Expert Advisory Panel on Chronic Degenerative Diseases.

Dr Paul Taillard, of France, has been appointed Medical Officer to the Radiation and Isotopes unit at WHO Headquarters. Dr Taillard worked for twenty years as a cancerologist in France, Cambodia, Viet Nam and China (Shanghai) before joining WHO in 1955. His first assignment with the Organization was with the cancer control project in Iran.

Dr John Burton, of Great Britain, has been appointed to the staff of the Health Education of the Public unit at WHO Headquarters. For the past ten years, Dr Burton has been Medical Director of the Central Council for Health Education in London, and during the past six months he has served as consultant for the European Office of WHO on assignments in Spain, Italy, Finland, Yugoslavia, the Netherlands, and Sweden. He has also served on the WHO Expert Committee on Health Education.

Review of WHO Publications

World Directory of Venereal-Disease Treatment Centres at Ports, Geneva, 1959, 162 pages. Price: 8/6, $1.75, or Sw. fr. 5.—. Bilingual publication (English and French).

The World Health Organization has just published a new edition of the list of centres in ports throughout the world at which merchant seamen can obtain treatment for venereal disease. Three editions of this list were published in 1933, 1935 and 1939, respectively, by the Office International d'Hygiène Publique, and a fourth by the World Health Organization in 1951. The list is published in application of the provisions of the Brussels Agreement of 1924 which was originally signed by 13 States and to which 67 countries and territories are now parties. Countries which are signatories to the Agreement undertake to provide merchant seamen and watermen suffering from venereal diseases with the necessary medical treatment and supplies, free of charge and without distinction of nationality; the same applies to hospital treatment, when it is considered necessary. A certain number of other countries not parties to the Agreement also make available all or part of the facilities provided under it, either free of charge or against partial or full payment by the shipping company, the shipping agent or the seaman himself.[1]

This directory is intended principally for the use of masters of merchant vessels, owners of river craft, and port health services. It contains an alphabetical list, by country and by port, of the existing treatment centres with the following information for each: name and address; consultation days and hours; type of service provided; availability of hospital facilities; and whether treatment is free or not. The text of the Brussels Agreement is also given, together with a list of the countries which have adhered to it or which unofficially apply its provisions, and a facsimile of the personal treatment booklet which is delivered to each seaman and in which is entered all information on diagnosis and treatment.

[1] A brief history of the Brussels Agreement and its application will be found in the article on page 111.

Bilharziasis

" This excellent monograph * is the first comprehensive study concerned with the species identification of snails belonging to the genera *Biomphalaria* and *Bulinus* that serve as intermediate hosts in the spread of bilharziasis in Africa. In attempting to classify the various species of these genera 5500 specimens from 794 different populations were studied.

" Experts in the field of malacology should welcome this attempt by the author to classify the various species of these genera. This excellent study should serve as a basis for more advanced work in relation to these snails of medical importance in Africa."

The American Journal of the Medical Sciences, December 1958.

* *Intermediate hosts of* Schistosoma, by G. Mandahl-Barth. (*World Health Organization : Monograph Series*, No. 37). Price: £1.—, $4.00, Sw. fr. 12.—.

International Non-Proprietary Names for Pharmaceutical Preparations

In accordance with paragraph 3 of the Procedure for the Selection of Recommended International Non-Proprietary Names for Pharmaceutical Preparations,[1] notice is hereby given that the following names are under consideration by the World Health Organization as proposed international non-proprietary names.

Comments on, or formal objections to, the proposed names may be forwarded by any person to the Secretary, Expert Advisory Panel on the International Pharmacopoeia and Pharmaceutical Preparations, World Health Organization, within four months from 1 April 1959.

The inclusion of a name in the lists of proposed international non-proprietary names does not imply any recommendation for the use of the substance in medicine or pharmacy.

PROPOSED INTERNATIONAL NON-PROPRIETARY NAMES (*Prop. I.N.N.*): LIST 8 [2]

Proposed International Non-Proprietary Name (Latin, English)	*Chemical Name or Description*
acetyldigitoxinum acetyldigitoxin	α-acetyldigitoxin
acidum trethocanicum trethocanic acid	3-hydroxy-3,7,11-trimethyldodecanoic acid
alimemazinum alimemazine	10-(2-methyl-3-dimethylaminopropyl)phenothiazine
amanozinum amanozine	2-amino-4-anilino-*s*-triazine
ambazonum ambazone	1,4-benzoquinone amidinohydrazone thiosemicarbazone hydrate
aminopromazinum aminopromazine	10-(2,3-bisdimethylaminopropyl) phenothiazine
aminoxytriphenum aminoxytriphene	3-dimethylamino,1,1,2-tris (4-methoxyphenyl)-1-propene
amopyroquinum amopyroquin	7-chloro-4-(4-hydroxy-3-pyrrolidin-1′-ylmethylanilino)quinoline
beclamidum beclamide	*N*-benzyl-β-chloropropionamide
benzmalacenum benzmalacene	*N*-(2,3-di-*p*-chlorophenyl-1-methylpropyl)maleamic acid (α- form)
bialamicolum bialamicol	3,3′-diallyl-5,5′-bisdiethylaminomethyl-4,4′-dihydroxydiphenyl

[1] See Annex 1, page 157.

[2] Other lists of proposed international non-proprietary names can be found in *Chronicle*, 1953, **7**, 297; 1954, **8**, 216, 313; 1956, **10**, 28; 1957, **11**, 231; 1958, **12**, 102; 1959, **13**, 105.

Proposed International Non-Proprietary Name (Latin, English)	*Chemical Name or Description*
brompheniraminum brompheniramine	(3-*p*-bromophenyl-3-pyrid-2′-ylpropyl)dimethylamine
broparoestrolum broparoestrol	1-bromo-2-*p*-ethylphenyl-1,2-diphenylethylene
bupheninum buphenine	1-(*p*-hydroxyphenyl)-2-(1-methyl-3-phenylpropylamino) propanol
buthalitalum natricum buthalital sodium	a mixture of 100 parts by weight of the monosodium derivative of 5-allyl-5-*iso*butyl-2-thiobarbituric acid and 6 parts by weight of exsiccated sodium carbonate
butopyrammonii iodidum butopyrammonium iodide	butyldimethyl(2,3-dimethyl-5-oxo-1-phenyl-3-pyrazolin-4-yl)ammonium iodide
chaulmosulfonum chaulmosulfone	4,4′-(bis-dihydrochaulmoogroylamido)diphenylsulfone
chlorazanilum chlorazanil	2-amino-4-*p*-chloroanilino-*s*-triazine
chlorbenzoxaminum chlorbenzoxamine	1-(2-*o*-chlorodiphenylmethoxyethyl)-4-*o*-methylbenzylpiperazine
chlormezanonum chlormezanone	2-(4-chlorophenyl)-3-methyl-4-metathiazanone 1,1-dioxide
chlorothiazidum chlorothiazide	6-chloro-7-sulfamoylbenzo-1,2,4(*4H*)-thiadiazine 1,1-dioxide
chlorphenesinum chlorphenesin	3-*p*-chlorophenoxypropane-1,2-diol
chlorphenoctii amsonas chlorphenoctium amsonate	2,4-dichlorophenoxymethyldimethyl-*n*-octylammonium amsonate (amsonic acid is 4,4′-diaminostilbene-2,2′-disulfonic acid)
chlorproguanilum chlorproguanil	N^1-3,4-dichlorophenyl-N^5-*iso*propyldiguanide
chlorpropamidum chlorpropamide	3-(*p*-chlorophenyl)sulfonyl-1-propylurea
chlorzoxazonum chlorzoxazone	5-chloro-2-benzoxazolone
cholini theophyllinas choline theophyllinate	choline salt of theophylline
clemizolum clemizole	1-*p*-chlorobenzyl-2-pyrrolidin-1′-ylmethylbenzimidazole
clemizolum penicillinum clemizole penicillin	benzylpenicillin combined with 1-*p*-chlorobenzyl-2-pyrrolidin-1′-ylmethylbenzimidazole
cyclandelatum cyclandelate	3,5,5-trimethyl*cyclo*hexyl mandelate
cyclobenzaprinum cyclobenzaprine	5-(3-dimethylaminopropylidene)dibenzo(*a*,*e*)*cyclo*heptatriene
cyclopregnolum cyclopregnol	6β-hydroxy-3,5-*cyclo*pregnan-20-one
dequalinii chloridum dequalinium chloride	decamethylenebis(4-aminoquinaldinium chloride)
dexamethasonum dexamethasone	9α-fluoro-16α-methylprednisolone

Proposed International Non-Proprietary Name (Latin, English)	*Chemical Name or Description*
diathymosulfonum diathymosulfone	di[4-(4-hydroxy-2-methyl-5-*iso*propylphenylazo)phenyl]sulfone
dichlormezanonum dichlormezanone	2-(3,4-dichlorophenyl)-3-methyl-4-metathiazanone 1,1-dioxide
dihydrocodeinum dihydrocodeine	
diloxanidum diloxanide	*N*-dichloroacetyl-*p*-hydroxy-*N*-methylaniline
dimethazanum dimethazan	1,3-dimethyl-7-(2-dimethylaminoethyl)xanthine
dimethisteronum dimethisterone	6α,21-dimethylethisterone
diphoxazidum diphoxazide	N^2-acetyl-N^1-(β-hydroxy-β,β-diphenylpropionyl)hydrazine
dithiazanini iodidum dithiazanine iodide	3-ethyl-2-[5-(3-ethyl-2-benzothiazolidinylidene)-1,3-pentadienyl] benzothiazolium iodide
fluorometholonum fluorometholone	9α-fluoro-11β,17α-dihydroxy-6α-methyl-1,4-pregnadiene-3,20-dione
furmethonolum furmethonol	5-morpholinomethyl-3-(5-nitrofurfurylideneamino)-2-oxazolidinone
furmethoxadonum furmethoxadone	5-methyl-3-(5-nitrofurfurylideneamino)-2-oxazolidinone
glybuthiazolum glybuthiazol	2-*p*-aminobenzenesulfonamido-5-*tert*.-butyl-1,3,4-thiadiazole
glyprothiazolum glyprothiazol	2-*p*-aminobenzenesulfonamido-5-*iso*propyl-1,3,4-thiadiazole
hedaquinii chloridum hedaquinium chloride	hexadecamethylenebis-(2-*iso*quinolinium)dichloride
hexadimethrini bromidum hexadimethrine bromide	*N,N,N′,N′*-tetramethylhexamethylenediamine trimethylene bromide polymer
hydroxindasolum hydroxindasol	5-hydroxy-1-(*p*-methoxybenzyl)-2-methyltryptamine
hydroxychloroquinum hydroxychloroquine	7-chloro-4-[4-(*N*-ethyl-*N*-2-hydroxyethylamino)-1-methylbutylamino] quinoline
hydroxydioni natrii succinas hydroxydione sodium succinate	sodium 21-(3-carboxypropionyloxy)pregnane-3,20-dione
hydroxymycinum hydroxymycin	an antibiotic substance obtained from cultures of *Streptomyces paucisporogenes*, or the same substance produced by any other means
hydroxyprogesteroni acetas hydroxyprogesterone acetate	17α-acetoxypregn-4-ene-3,20-dione
hydroxyprogesteroni caproas hydroxyprogesterone caproate	17α-hexanoyloxypregn-4-ene-3,20-dione
imipraminum imipramine	5-(3-dimethylaminopropyl)-10,11-dihydro-5*H*-dibenz[*b,f*] azepine
inproquonum inproquone	2,5-bisethyleneimino-3,6-dipropoxy-1,4-benzoquinone

Proposed International Non-Proprietary Name (Latin, English)	*Chemical Name or Description*
isopropamidi iodidum isopropamide iodide	(3-carbamoyl-3,3-diphenylpropyl)di*iso*propylmethylammonium iodide
isoxsuprinum isoxsuprine	1-(*p*-hydroxyphenyl)-2-(1′-methyl-2′-phenoxyethylamino)-1-propanol
khellosidum khelloside	2-hydroxymethyl-5-methoxy-furanochromone glucoside
levomepromazinum levomepromazine	(-)-10-(3-dimethylamino-2-methylpropyl)-2-methoxyphenothiazine
lysergidum lysergide	lysergic acid diethylamide
mannomustinum mannomustine	1,6-di-(2-chloroethylamino)-1,6-dideoxy-D-mannitol
melphalanum melphalan	*p*-di(2-chloroethyl)amino-L-phenylalanine
methocarbamolum methocarbamol	(2-hydroxy-3-*o*-methoxyphenoxypropyl)carbamate
methohexitalum methohexital	α-(±)-5-allyl-1-methyl-5-(1-methyl-2-pentynyl)barbituric acid
methylprednisolonum methylprednisolone	6-methylprednisolone
monophosphothiaminum monophosphothiamine	monophosphoric ester of thiamine
orphenadrinum orphenadrine	*N*,*N*-dimethyl-2-(α-*o*-tolylbenzyloxy)ethylamine
oxadimedinum oxadimedine	*N*-(2-benzoxazolyl)-*N*-benzyl-*N*′,*N*′-dimethylethylenediamine
oxanamidum oxanamide	2-ethyl-3-propylglycidamide
oxybuprocainum oxybuprocaine	2-diethylaminoethyl 4-amino-3-butoxybenzoate
oxyphenbutazonum oxyphenbutazone	1-(*p*-hydroxyphenyl)-2-phenyl-4-butyl-3,5-pyrazolidinedione
oxyphenisatinum oxyphenisatine	3,3-bis(4-hydroxyphenyl)oxindole
paracetamolum paracetamol	*p*-acetamidophenol(acetaminophen)
paridocainum paridocaine	1-methylpiperid-4-yl *p*-butylaminobenzoate
pasiniazidum pasiniazid	*iso*nicotinylhydrazide *p*-aminosalicylate
pecazinum pecazine	10-(1-methyl-piperid-3-ylmethyl)phenothiazine
pempidinum pempidine	1,2,2,6,6-pentamethylpiperidine
perphenazinum perphenazine	2-chloro-10-[3-{4-(2-hydroxyethyl)piperazin-1-yl}propyl]phenothiazine

Proposed International Non-Proprietary Name (Latin, English)	*Chemical Name or Description*
phenactropinii chloridum phenactropinium chloride	*N*-phenacylhomatropinium chloride
pheniraminum pheniramine	dimethyl(3-phenyl-3-pyrid-2′-ylpropyl)amine
phenyracillinum phenyracillin	2,5-diphenylpiperazine di(benzylpenicillin)
piprinhydrinatum piprinhydrinate	4-diphenylmethoxy-1-methylpiperidine salt of 8-chlorotheophylline
poloxalkolum poloxalkol	polymer of ethylene oxide, propylene oxide and propylene glycol
polybenzarsolum polybenzarsol	a mixture of polymers formed from the reaction of formaldehyde and 4-hydroxybenzenearsonic acid
poskinum poskine	propionylhyoscine
propiomazinum propiomazine	10-(2-dimethylamino-1-methylethyl)-2-propionylphenothiazine
protamini sulfas protamine sulfate	sulfate of the strongly basic protein, protamine
pyrazinamidum pyrazinamide	pyrazine-2-carboxyamide
renanolonum renanolone	3α-hydroxypregnane-11,20-dione
ristocetinum ristocetin	an antibiotic substance obtained from cultures of *Nocardia lurida*, or the same substance produced by any other means
salinazidum salinazid	*N-iso*nicotinoyl-*N*′-salicylidenehydrazine
sulfaethidolum sulfaethidole	N^1-(5-ethyl-1,3,4-thiadiazol-2-yl)sulfanilamide
sulfamethoxypyridazinum sulfamethoxypyridazine	6-methoxy-3-sulphanilamidopyridazine
sulfinpyrazonum sulfinpyrazone	1,2-diphenyl-4-(2-phenylsulfinylethyl)-3,5-pyrazolidinedione
sulocarbilatum sulocarbilate	2-hydroxyethyl *p*-sulfamylcarbanilate
tacrinum tacrine	9-amino-1,2,3,4-tetrahydroacridine
thalidomidum thalidomide	α-phthalimidoglutarimide
thiambutosinum thiambutosine	1-(*p*-butoxyphenyl)-3-(*p*-dimethylaminophenyl)thiourea
thiocolchicosidum thiocolchicoside	2,14-di(demethoxy)-2-glucosidoxy-14 methylthiocolchicine
thiopropazatum thiopropazate	10-[3-⌈4-(2-acetoxyethyl)piperazin-1-yl⌉propyl]-2-chlorophenothiazine
thioridazinum thioridazine	10-[2-(1-methylpiperid-2-yl)ethyl]-2-methylthiophenothiazine

Proposed International Non-proprietary Name (Latin, English)	*Chemical Name or Description*
triacetinum triacetin	glyceryl triacetate
triacetyloleandomycinum triacetyloleandomycin	the triacetyl ester of oleandomycin, an antibiotic substance obtained from cultures of *Streptomyces antibioticus*, or the same substance produced by any other means
triamcinolonum triamcinolone	9α-fluoro-16α-hydroxyprednisolone
trimethidinii methylsulfas trimethidinium methylsulfate	(+)-3-(3-dimethylaminopropyl)-1,8,8-trimethyl-3-aza*bicyclo*[3,2,1] octane di(methylmethosulfate)
tropiglinum tropigline	tiglyltropine
xylometazolinum xylometazoline	2-(4-*tert.*-butyl-2,6-dimethylbenzyl)imidazoline

Annex 1

PROCEDURE FOR THE SELECTION OF RECOMMENDED INTERNATIONAL NON-PROPRIETARY NAMES FOR PHARMACEUTICAL PREPARATIONS *

The following procedure shall be followed by the World Health Organization in the selection of recommended international non-proprietary names for pharmaceutical preparations, in accordance with the World Health Assembly resolution WHA3.11:

1. Proposals for recommended international non-proprietary names shall be submitted to the World Health Organization on the form provided therefor.

2. Such proposals shall be submitted by the Director-General of the World Health Organization to the members of the Expert Advisory Panel on the International Pharmacopoeia and Pharmaceutical Preparations designated for this purpose, for consideration in accordance with the " General principles for guidance in devising International Non-proprietary Names ", appended to this procedure.[1] The name used by the person discovering or first developing and marketing a pharmaceutical preparation shall be accepted, unless there are compelling reasons to the contrary.

3. Subsequent to the examination provided for in article 2, the Director-General of the World Health Organization shall give notice that a proposed international non-proprietary name is being considered.

A. Such notice shall be given by publication in the *Chronicle of the World Health Organization* and by letter to Member States and to national pharmacopoeia commissions or other bodies designated by Member States.

(i) Notice may also be sent to specific persons known to be concerned with a name under consideration.

* Text adopted by the Executive Board in resolution EB15.R7 (*Off. Rec. Wld Hlth Org.*, 1955, 60, 3)

[1] See Annex 2, page 159.

B. Such notice shall:

(i) set forth the name under consideration;

(ii) identify the person who submitted a proposal for naming the substance, if so requested by such person;

(iii) identify the substance for which a name is being considered;

(iv) set forth the time within which comments and objections will be received and the person and place to whom they should be directed;

(v) state the authority under which the World Health Organization is acting and refer to these rules of procedure.

C. In forwarding the notice, the Director-General of the World Health Organization shall request that Member States take such steps as are necessary to prevent the acquisition of proprietary rights in the proposed name during the period it is under consideration by the World Health Organization.

4. Comments on the proposed name may be forwarded by any person to the World Health Organization within four months of the date of publication, under article 3, of the name in the *Chronicle of the World Health Organization.*

5. A formal objection to a proposed name may be filed by any interested person within four months of the date of publication, under article 3, of the name in the *Chronicle of the World Health Organization.*

A. Such objection shall:

(i) identify the person objecting;

(ii) state his interest in the name;

(iii) set forth the reasons for his objection to the name proposed.

6. Where there is a formal objection under article 5, the World Health Organization may either reconsider the proposed name or use its good offices to attempt to obtain withdrawal of the objection. Without prejudice to the consideration by the World Health Organization of a substitute name or names, a name shall not be selected by the World Health Organization as a recommended international non-proprietary name while there exists a formal objection thereto filed under article 5 which has not been withdrawn.

7. Where no objection has been filed under article 5, or all objections previously filed have been withdrawn, the Director-General of the World Health Organization shall give notice in accordance with subsection A of article 3 that the name has been selected by the World Health Organization as a recommended international non-proprietary name.

8. In forwarding a recommended international non-proprietary name to Member States under article 7, the Director-General of the World Health Organization shall:

A. request that it be recognized as the non-proprietary name for the substance; and

B. request that Member States take such steps as are necessary to prevent the acquisition of proprietary rights in the name, including prohibiting registration of the name as a trade-mark or trade-name.

Annex 2

GENERAL PRINCIPLES FOR GUIDANCE IN DEVISING INTERNATIONAL NON-PROPRIETARY NAMES *

1. Names should, preferably, be free from any anatomical, physiological, pathological or therapeutic suggestion.

2. An attempt should first be made to form a name by the combination of syllables in such a way as to indicate the significant chemical groupings of the compound and/or its pharmacological classification. Preference should be given to the following syllables:

Latin	*English*	*French*	
inum	ine	ine	for alkaloids and organic bases
olum	ol	ol	for alcohols and phenols (-OH group)
alum	al	al	for aldehydes
onum	one	one	for ketones and other substances containing the CO group
enum	ene	ène	for unsaturated hydrocarbons
anum	ane	ane	for saturated hydrocarbons
cainum	caine	caïne	for local anaesthetics of the procaine type
mer	mer	mer	for mercurial compounds
sulfonum	sulfone	sulfone	for sulfone derivatives
quinum	quine	quine	for antimalarial substances containing a quinoline group
crinum	crine	crine	for antimalarial substances containing an acridine group
sulfa	sulfa	sulfa	for derivatives of sulfanilamide having an antibacterial action
dionum	dione	dione	for anti-epileptics derived from oxazolidinedione
toinum	toin	toïne	for anti-epileptics derived from hydantoin
stigminum	stigmine	stigmine	for anticholinesterases of the physostigmine (eserine) type.

3. Names should be distinctive in sound and spelling. They should not be inconveniently long and should not be liable to confusion with names already in use.

4. The addition of a terminal capital letter or number should be avoided as far as possible.

5. Names proposed by the person discovering or first developing and marketing a pharmaceutical preparation, or already officially adopted in any country, or used in national pharmacopoeias, or in works of reference such as " New and Non-official Drugs ", should receive preferential consideration.

6. Cognizance should be taken of the names of closely related substances and, where desirable, the name should show this relationship.

* These principles replace those published in *Chronicle*, 1958, **12**, 111.

BULLETIN

DE L'ORGANISATION MONDIALE DE LA SANTÉ

OF THE WORLD HEALTH ORGANIZATION

Evaluation of the health hazards involved in house-spraying with DDT—*Homer R. Wolfe, Kenneth C. Walker, Joseph W. Elliott & William F. Durham*

Exposure of spray-men to dieldrin in residual spraying—*T. E. Fletcher, J. M. Press & D. Bagster Wilson*

Pyrimethamine resistance in *Plasmodium vivax* malaria—*Martin D. Young & Robert W. Burgess*

The development of pyrimethamine resistance by *Plasmodium falciparum*—*Robert W. Burgess & Martin D. Young*

Morphology and development of the salivary glands and their chromosomes in the larvae of *Anopheles stephensi* s.s.—*N. Rishikesh*

Studies on insecticide-resistant anophelines: 2. Chromosome arrangements in laboratory-developed DDT-resistant strains of *Anopheles atroparvus*—*E. Mosna, C. Palmieri, K. R. S. Ascher, L. Rivosecchi & I. Neri*

The susceptibility and resistance of *Bulinus (Physopsis) globosus* and *Bulinus (Bulinus) truncatus rohlfsi* to two strains of *Schistosoma haematobium* in Ghana—*Fergus S. McCullough*

The fox as a definitive host of *Echinococcus* and its role in the spread of hydatid disease—*M. A. Gemmell*

Some general remarks and new observations on psittacosis and ornithosis—*K. F. Meyer*

Improvement of the antigenicity of antirabies vaccine by pooling checked by post-challenge vaccination of guinea-pigs—*N. Veeraraghavan*

A survey of oral health, Qalyub Project, Egypt—*M. G. Wheatcroft & C. R. Klimt*

Notes

Bibliographical Section

Typhus and related infections

Vol. 20, No. 1 (1959), 182 pages **10/- $2.00 Sw. fr. 6.—**

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